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## CONTENTS

Soviet Doctrine on the Decisive Factors in Modern War .....	3
<i>Dr. Raymond L. Garthoff</i>	
The Army System of Fallout Prediction .....	23
<i>Major Francis J. Dirkes, Corps of Engineers</i>	
Crowd Them With Rifles .....	32
<i>Lieutenant Colonel Anthony L. Wermuth, Infantry</i>	
"Follow Me"—United States Army Infantry School .....	35
A United States Counteraggression Force .....	50
<i>Lieutenant Colonel H. P. Rand, Artillery</i>	
Coordination of Fire and Maneuver on the Nuclear Battlefield .....	56
<i>Major Robert M. Young, Artillery</i>	
MILITARY NOTES AROUND THE WORLD .....	67
MILITARY DIGESTS .....	77
<i>The Natural Strategic Bastions</i> .....	
<i>Training for Soviet Underground and Espionage in West</i>	
<i>Germany</i> .....	
<i>Soviet Seapower—Psychological Factors</i> .....	
<i>On Relative Strengths</i> .....	
<i>Civil Defense in the Nuclear Age</i> .....	
<i>Ground Fortifications—Today?</i> .....	
BOOKS OF INTEREST TO THE MILITARY READER .....	110



# Soviet Doctrine on The Decisive Factors in Modern War

Dr. Raymond L. Garthoff

*This article, a result of extensive research by the author of hundreds of documents most of which are in the Russian language, is based on a chapter from Dr. Garthoff's new book, The Soviet Image of Future War, soon to be published by the Public Affairs Press, Washington, D. C.—Editor.*

THE Soviet view of the factors which will decide a future war is of vital concern to the United States and to the nations of the free world. While there are many facets to this subject, a key one is the Soviet view of the essential nature of such a conflict, and particularly whether it will be long and dependent on basic power potentials, or can be concluded quickly.

It is evident that on such sensitive matters the Soviets are unlikely to disclose their full position frankly in published media, but we are greatly assisted in divining their thinking by what they tell their own senior officers. Moreover, these matters are, of course, a key and integral part of the over-all Soviet strategic conceptions in the nuclear era.

Before reviewing the development of current Soviet doctrine on the decisive factors in modern war, it may be useful to note as background one recent passage which presents well the Soviet conclusion

on the crucial question of the duration of a future general war. It is taken from an article by Colonel I. S. Baz in the Soviet Army journal *Military Herald* (equivalent of the *Military Review*) in June 1958:

*Technology of course quickens the pace of things, and generally speaking the appearance of new technical means creates now certain possibilities for achievement of victory in shorter times than before. Nonetheless, the armed forces of the two sides, and the scale of the arena of armed conflict under contemporary circumstances, are so great that one could scarcely conclude a war in a short period. Even the appearance of atomic and hydrogen weapons, and IRBM's and ICBM's cannot secure the swift destruction of such massive armed forces, and consequently not the conclusion of the war. Moreover, the use of these weapons by both sides will more likely lead to extending the duration of the war than to speeding it. Hence, while in the past major wars could be short or long, in our time all major wars inevitably assume a quite drawn-out character.*

This is the Soviet image of future war. What, then, in the Soviet view are the key factors in determining its outcome?

## Fundamental Factors

Soviet military doctrine emphasizes a number of elements which are termed the "decisive" or "fundamental" factors (for-

***The Soviet view sees victory only through the destruction of opposing military power in a long, hard, worldwide war requiring large ground armies, tense morale demands, and an all-encompassing economic effort***

merly termed "the permanently-operating factors") which, it is said, "decide the course and outcome of wars." These factors represent the elements of national power which the Soviets believe in the final analysis play the decisive role in war.

It may be useful to begin by a review of the evolution of Soviet thinking on these basic elements. The "permanently-operating factors" were compiled originally by Stalin in Order Number 55 of 23 February 1942. This thesis served thereafter as an effective expression of Soviet military doctrine until 1956, and was widely repeated in Soviet military writings and by military leaders such as Marshals Zhukov, Malinovsky, Konev, Vasilevsky, and Sokolovsky.

The five "permanently-operating factors which decide the course and outcome (or fate) of wars," in the precise words of Stalin, were:

1. The stability of the rear.
2. The morale of the army.
3. The quantity and quality of divisions.
4. The armament of the army.

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5. The organizing ability of the command personnel.

These permanently-operating factors were contrasted with transitory or temporary factors, which it was admitted might be significant at some stage of a war (especially at the beginning), and which might even affect importantly the course and outcome of the war, but which were not considered to be *decisive* in determining the ultimate outcome of a war. The most important of the transitory factors was surprise.

At the time the thesis of the permanently-operating factors was first presented, it clearly served the purpose of bolstering popular and military morale by assurance that the German successes, based upon the exploitation of temporary factors such as surprise, were transitory and that the Soviets would ultimately win. And, in fact, the German expectations of the consequences of their surprise blow did turn out to have been exaggerated, and the Soviet (and Allied) basic strength *did* lead to victory. Again in the period from 1945 until Stalin's death in 1953, this thesis could be invoked for assurance that Soviet basic strength was not overwhelmed by the American monopoly, and later superiority, in nuclear weapons. These considerations doubtless contributed to the propagation and the ingraining of the explicit doctrine of the decisive role of the permanently-operating factors, although, in fact, the factors had been dominant in Soviet doctrine long before Stalin enunciated them in his "thesis."

During the Stalinist postwar era, virtually all serious Soviet discussions of military science and strategy, and most public and popular speeches and discussions of military affairs, invoked the permanently-operating factors. Since, unlike most aspects of so-called "Stalinist" military science, this formulation was, in fact, apparently a contribution of Stalin himself, it was particularly moot whether the

thesis of the permanently-operating factors would survive the modifications of military doctrine in the post-Stalin era. The evolution of Soviet views on this question since 1953 is of interest.

### Post-Stalin Era

Marshal A. Vasilevsky delivered the first post-Stalin pronouncement on military science in an article in *Pravda* a few days after the dictator's death. It was, both in intent and in content, a memorial to Stalin. And in it Vasilevsky repeated the long-standard theme that:

*The principle of the permanently-operating factors which decide the fate of modern wars, profoundly worked out by Comrade Stalin, is the key to a genuinely scientific materialistic understanding and use of the objective laws of war. This Stalinist thesis arms the Soviet people, its armed forces, with a clear and really scientific understanding of the necessary conditions which . . . in case of war, will secure victory over the enemy.*

This statement may have been in part a reflex of the Stalinist period. But Vasilevsky—then the senior professional officer (Eulganin having reassumed the Ministry of Defense, and Zhukov having become the second of three "First Deputy Ministers")—repeated twice a year later in *Red Star* (February and May 1954) that Soviet (no longer "Stalinist") military science "is based upon the permanently-operating factors which determine the outcome of wars."

An article in September 1953, by Major General N. Talensky, which opened a debate on the nature and laws of military science, made explicit for the first time the view that the permanently-operating factors were not *themselves* the laws of military science. This modification was intended to strengthen the viability of the concept of the permanently-operating factors, and to facilitate its transition into the emerging post-Stalinist military science. General Talensky writing in *Military*

*Thought* in September 1953 made quite clear that: "We are far from minimizing the great significance in principle for military science of the thesis of the permanently-operating factors." And in an italicized paragraph he emphasized that:

*Victory in contemporary war is achieved by a decisive defeat of the enemy in the course of armed conflict . . . on the basis of superiority in the permanently-operating factors which determine the fate of wars. . . .*

The continued Soviet restatements of the decisive role of these factors has undergone several other modifications. In early 1954 it was usual for military writers to contrast Soviet recognition of these factors with a nonawareness of them in Imperialist military doctrines. For example, Colonels S. Mazhorov and I. Tikhonov writing in *Red Star* stated that:

*In contradistinction to bourgeois military theory, Soviet military science is based on the recognition of the decisive role in the conduct and outcome of contemporary wars of the permanently-operating factors. . . .*

Marshal Vasilevsky, in the statement cited earlier, and many other writers at that time, made the same point.

### Shift in Doctrine

During the following year an interesting shift took place, reflecting the increasing awareness of the need to study foreign military thinking. A reprinting, with revisions, of an important article by a military professor, Major General N. Pukhovskiy affords an excellent opportunity to judge this shift. General Pukhovskiy's article, entitled "The Creative Character of Soviet Military Science," appeared first in the *Military Herald*, organ of the ground forces, in January 1954. It was republished in February 1955, in a collection of articles on various aspects of Marxism-Leninism in Soviet military science. A

comparison of the relevant passage in the two printings is revealing. In early 1954 Pukhovskiy had written:

*It is well known that bourgeois military thought, because of class limitations, always regarded and regards the questions of conducting war only as questions of military art and in isolation from the economic and morale potentialities of the country. Only Soviet military science, with its thesis on the permanently-operating factors . . . placed these questions on a deeply scientific basis.*

In early 1955 the passage was amended to read:

*It is well known that contemporary bourgeois military science, in studying military, economic and moral-political questions, cannot give a scientific explanation of the laws governing war because it is based on an anti-scientific, idealistic world-view, and therefore its conclusions often are erroneous, adventurist. Only Soviet military science, guided by Marxist-Leninist theory and studying the experience of past and contemporary wars, generalized the question of the permanently-operating factors, which decide the fate of wars, and scientifically formulated them.*

Thus it would appear that the Capitalists ignored the questions of the economic and morale potentialities of the country in 1954, "as is well known," but in studying them in 1955, "as is well known," failed to explain the basic laws underlying them. Moreover, the distinction credited to Soviet military thought is reduced to having "scientifically formulated" them. Nonetheless, this is not an idle or insignificant distinction in the Soviet view.

The statements cited here (except for the one by General Talensky) were not made in the course of the debate on the nature of military science. In that discussion the idea of the universality of the laws of war had been debated and finally

accepted. One important point developed in the debate was the conclusion stated by Colonel G. Sapozhkov in *Military Thought* that the thesis on the permanently-operating factors also "applies and has equal force for both contending sides. It is another question by whom and how this law is understood, and how it can be utilized for victory."

#### Other Factors Necessary

Another aspect of the thesis on the permanently-operating factors arose in the debate. Some of the participants, still wedded to the old Stalinist clichés, cited the thesis on these factors as the end-all of any question of basic laws of military science (and usually these persons were the ones who ascribed an innate and unique Soviet cognizance of these factors). In the final editorial commenting on the debate, *Military Thought* decisively disposed of such a view: "It is easy to see that this is at least an avoidance of the question and not its solution, and at worst a voluntary or involuntary retreat from positions of Marxist materialism." But the thesis on the permanently-operating factors was not, itself, rejected by any means. To note one general restatement, the article on the factors in the *Great Soviet Encyclopedia* (in the volume which appeared in June 1955) fully reiterated their continuing validity.

The editorial in *Military Thought* in March 1955 also examined this question. It noted that the thesis on the permanently-operating factors was "often approached one-sidedly and in some cases even incorrectly," but it characterized the thesis *itself* as one which "retains its scientific value also at the present." Thus:

*The thesis on the permanently-operating factors, expressing the dependence of the fate of wars on the fundamental social-economic causes and conditions does not, of course, lose its definitive significance in contemporary wars. But it would be in-*

*correct to ignore also other factors which play an important role in the achievement of victory in contemporary war.*

Slavish and unthinking mere repetition of the thesis on the permanently-operating factors was criticized; the importance of the factors themselves was not.

One change which occurred during the debate in 1954, and which was reflected in the revision of Pukhovsky's article, was publicly expressed in March 1955 in *Red Star* by Marshal of the Tank Troops P. Rotmistrov. Referring to some specified typical Soviet statements made in 1954, Rotmistrov commented that:

*... from their discussions one can reach the conclusion that the permanently-operating factors are divined only by Soviet military science, and that the idea had not occurred to bourgeois military science. If that were the case we could rest assured; we, silent, would calculate the permanently-operating factors. ... One cannot, of course, agree with this [view]. ... We must calculate on the basis that the bourgeois military figures, bourgeois military science, does not deny the significance of the permanently-operating factors. Can it really be only on the basis that bourgeois military science perhaps gives these things different names? The fact of the matter is not in names, but in the essence of the question. It should incidentally be said that the permanently-operating factors which decide the fate of wars have, to one or another degree, been considered also in the past by strategists seeking victory.*

The thesis on the decisiveness of the permanently-operating factors thus survived the partial "de-Sovietization" involved in admitting objective laws and partial bourgeois cognizance of the importance of these factors.

#### Importance of Surprise

Another challenge arose in the reassessment of the role of surprise. The permanently-operating factors also continued

through the revision of the importance of surprise to enjoy their position of being regarded as decisive in determining the ultimate outcome of wars, except under particular conditions. Those military theoreticians and publicizers who most prominently advanced the upgrading of the role of surprise, such as Marshal of the Tank Troops Rotmistrov and Lieutenant General S. Shatilov, made quite clear that despite the attribution of much greater significance to surprise in the thermonuclear era, the "permanently-operating" factors remain fundamental and decisive. Thus Rotmistrov stated (in March 1955):

*However, surprise cannot yield a decisive result, cannot bring victory in a war with a serious and strong enemy. ... Consequently, the permanently-operating factors, in the final analysis, have always decided and will always decide the course and outcome of wars.*

And General Shatilov reiterated (in May 1955):

*Soviet military science, while taking into account the growing role of surprise, is far from inclined to underrate the role of the permanently-operating factors, which decide the fate of wars.*

The volume of the *Great Soviet Encyclopedia* in which the article on "The Permanently-Operating Factors of War" appears went to press in June 1955; the author of the article is Major General Talensky. The article stated:

*Soviet military science does not deny the serious significance of the temporary factors: surprise, advantage in [psychological] mobilization, combat experience, etc., but it relies upon the permanently-operating factors to which the decisive role belongs.*

Major General Ye. Boltin, in an article in *Red Star* in August 1955, "On Soviet and Bourgeois Military Science," empha-

sized the things held in common by foreign and Soviet military thinking, but nonetheless found great difference on the point of the decisive factors. Indeed, he even used the earlier phrase "in contradistinction to bourgeois military science" in describing Soviet reliance on these factors. He noted that while Soviet military science "understands the significance in contemporary war of the factor of surprise of attack and other temporary factors," it "*relies on the well-known thesis of the permanently-operating factors which determine the outcome of wars. . .*"

### Reaffirmation

It may be useful, in view of a prevalent misconception assuming this thesis to have been rejected on doctrinal grounds, to note the frequency of reiteration of the thesis on the decisive role of the permanently-operating factors throughout and subsequent to the debates on military science. In the period 1953 through 1955, there were at least 57 reaffirmations of this thesis. However, in the period following Khrushchev's attack on Stalin (in February 1956), reference to the thesis by the old name virtually ceased. The factors themselves *are* constantly reiterated and reaffirmed, simply not under the old rubric.

The reason for the persistence of Soviet attention to the "decisive factors" is that they are meaningful as an expression of important elements deeply imbedded in current Soviet military doctrine for nuclear as well as nonnuclear war. Even though the thesis formulation itself has fallen into disuse, the major practical significance of the factors involved continues and will continue so long as the strategic concept is basically unchanged. The fundamental importance of these factors has not at any time been rejected or criticized by any Soviet source. On the contrary, during the doctrinal revisions of 1953-55 an attempt was made to revitalize the thesis so that it would be treated not merely as

a formula, but as a practical guide in creative thinking on military affairs.

Those who introduced modifications on its role and on related issues such as the role of surprise reaffirmed explicitly and unambiguously the continued role of the decisive permanently-operating factors. More recently (1956-59) these factors usually have been spoken of simply as "the decisive factors in war." This illustrates clearly what has gradually happened to the thesis—modification in form, but not in essential content and influence. Such a change has occurred because of the fact that the *formulation* of the "permanently-operating factors" was so closely associated with the name of Stalin, and particularly because it had become ossified into a stereotyped formula.

What, one may ask, is the practical significance of the doctrine of the decisive factors? Colonel A. Piatkin, a professor at the Frunze Academy, has indicated their importance as follows:

*The enormous significance, not only theoretical but practical also, of the thesis on the permanently-operating factors in war consists in the fact that it shows on which main tasks the strength of the combatant state must be concentrated in order to secure victory in war. That thesis is therefore the key to the understanding of the perspectives of a war and the means to gain victory.*

But the potentiality must not be confused with reality. *Those are two different things. In order to convert the potentiality for victory into reality, it is necessary not only to know the objective laws of war, but also to be able to apply them with complete knowledge of affairs, with a calculation of the character and all the requirements of contemporary warfare.*

If, indeed, a decisive significance is attributed to these factors and they are a basis for determining priorities in military development, their practical significance is readily seen to be immense.



### No Soviet Monopoly

As has been noted, it came to be realized by Soviet military thinkers in 1954 and 1955 that Soviet military doctrine had no monopoly on comprehension of the basic objective laws of war nor even on the concept of the decisiveness of basic morale, and economic and military potentialities. Inasmuch as this very concept had previously been held to give Soviet military science a superiority over bourgeois military doctrines, the changed appreciation raised the serious question of the possible disappearance of this superiority.

A solution was found which, while conceivably sophistry, is more likely to represent the real Soviet view. The new point in Soviet military thinking was introduced into available published literature in the previously mentioned collection of articles on Soviet military science printed in early 1955. The following sentences, which had not appeared in the article by Major General Pukhovsky as it was originally published in 1954, were added to his article in the symposium in 1955.

*In the conditions of the socialist system, there exist all the realistic potentialities for the achievement of an advantage over the enemy in all the permanently-operating factors. . . .*

*Soviet military science shows that victory in war is gained by that state which secures for itself for the whole course of the war a superiority in the permanently-operating factors which decide the fate of wars. . . .*

Marshal Rotmistrov, in his article in March 1955, reiterated this point, as have others more recently.

*We do not doubt that in the circumstances of our socialist economic system . . . there exist all the necessary potentialities for the achievement of superiority in the basic, decisive, permanently-operating*

*factors. In that is our superiority, our strength, and our invincibility.*

The Soviet Union is thus described as possessing a superior potential in basic economic, morale, and military strength, a potential which must be realized by active Soviet policy measures. This statement should be read in the light of the traditional Bolshevik emphasis on distinguishing between potentialities, which are so to speak the raw material of history, and the manipulative role of proletariats and policymakers in converting these potentialities into real achievements. Colonel Piatkin made this point explicit in his earlier cited statement. In a work on *Marxism-Leninism on War and the Army* published in 1957, Colonel Zakharov explicitly noted that: "Victory in war depends not only on the economic and morale potentialities, the quantity and quality of troops, and the armament of the army, but also on how well these factors will be utilized." Specifically, this concept provides the doctrinal basis for the policy of priority to realizing the potentialities of the Soviet economic system in military strength.

The decisive (permanently-operating) factors were defined and interpreted by Major General Talensky in the *Encyclopedia* article in 1955 as the "economic, political, and military factors which decide the course and outcome of wars." Although the "thesis" on the factors was soon thereafter dropped, the factors (much as interpreted by Talensky) have continued and presently continue to be reaffirmed. The first of the factors, called "the stability of the rear," Talensky defined as "encompassing the economic, political and morale potentialities of a state." And, as a number of Soviet writers have indicated, "it is no accident that among the permanently-operating factors which decide the fate of wars, stability of the rear stands in first place."

The "rear" supplies the combat forces



with the wherewithal to conduct military operations; basically, this means the war-making potential of the country. The main element in this potential is the economy, particularly industry and transportation.

In June 1958 Colonel Baz stated in the *Military Herald*:

*The history of wars teaches that only those states withstood the trials of war which showed themselves stronger than their opponents in the development and organization of the economy. Moreover, one of the fundamental laws of victory in contemporary war consists precisely in the fact that in its foundation contemporary war is an economic war. . . . Consequently, future war will in still greater degree than past world wars require in its preparation and conduct a precise calculation of the economic potentials of one's own country and of the enemy.*

In another article in 1958, on "Economic Potential and Its Significance in Modern War," Lieutenant Colonel V. Strigachev presented the ideological basis for superiority in this particular fundamental factor: "under equal economic potentials, the military economic potential of the socialist country is greater than that of a capitalist country." But the Soviets go much further in claiming that such a superiority even offsets a greater economic production. As Colonel I. N. Levanov put it in *Marxism-Leninism on War and the Army*:

*One cannot judge the economic potential of a country only according to the level of development of production or the strength of the production facilities and economic resources. It is essential to give attention also to the character of the economic and state structure, on which depends the effectiveness of the utilization of economic resources and the tempo of productive development, which has great significance in military affairs as well.*

Thus he continues:

*The socialist system of economy . . .*

*gives our state an enormous superiority over any capitalist state in relation to the economic and morale potential of the country and to its utilization to achieve victory in war.*

This view is regularly expressed by Soviet military writers.

#### Morale

Morale is the second key factor. Colonel P. Sidorov, in an article on "Morale Potential and Its Significance in Modern War," stated:

*He who has the greatest reserves, the greatest sources of strength, the greatest endurance and popular steadfastness, is victorious in war. This Leninist principle is confirmed by the entire experience of wars in the [current] machine era. From this it is clear that for victory in modern war it is necessary to have a superiority over the enemy in the economic, morale, and military respects, that is, to command a higher economic, morale, and military potential.*

If these statements reflect the true Soviet appreciation of the importance of morale, the question immediately presents itself: who has the strongest morale, and why?

As stated by General Talensky the Soviets have always shown confidence that: "The morale esprit of the armed forces of a state with an advanced social and political structure, conducting a just war, will always be higher than the morale of the armed forces of a state with a reactionary system, conducting an unjust, aggressive war."

While the Soviets in recent years have admitted that contemporary bourgeois military science cannot fail to consider economic and morale potentials of the combatant sides along with the purely military potentialities, they consistently argue that only the Soviets are able properly to understand morale and its sources, and to

utilize and maximize morale. As Colonel P. Kashirin put it:

*Military figures of the capitalist countries also attempt to rely upon the morale strengths of their states, but their strategy cannot count upon the lasting morale support of the entire society because it does not express the interests of the people, is not inspired by the good aims of a just war. Such a strategy leads to an over-evaluation of the purely military factors, to adventurism in military art, to over-estimating the role of one or another weapon, arm, or element of the armed forces.*

It is of interest that the morale issue thus is related to the alleged Western over-reliance on "ultimate" weapons. Thus too, Western "military ideologies" are said to grasp at deception and at the comfort of the individual soldier, rather than at the "true" political-ideological foundations for morale. In a recent article by Colonel V. Kulish this writer was singled out for attack for allegedly "crudely distorting the question of the sources of the high morale-combat qualities of the personnel of the Soviet army and navy. The American sociologist [sic] Garthoff, for example, considers that the combat and morale qualities of the Soviet soldier are due to 'the traits of the Russian character,' his 'general love for Russia' . . ." More precisely, although the Soviets preferred not to quote it, I had said that in World War II the Soviet soldier had generally fought well not *because* of the Soviet regime, but *despite* it.

There can be little doubt of the sincerity of Soviet concern over morale—the extensive indoctrination and surveillance both in the armed forces and in civilian life bears witness to that fact. The matter of Soviet views of "stability" of Soviet, American, and other populations and armies is, however, one on which the publicly stated line may or may not correspond to actual

estimates. But regardless of unexpressed Soviet leadership apprehensions over the morale of the Soviet people—or even because there may be such—the importance of this factor in Soviet military thinking is clear.

The "readjustment" of Soviet military doctrine to fit the nuclear age—for this is what the modifications amount to—has but enhanced the importance of morale in Soviet eyes. In one of the earliest Soviet accounts to discuss this question specifically, Colonel Piatkin wrote in *Military Thought* (in March 1954):

*It is necessary to underline that in the complex conditions of future war, with the employment of new powerful weapons, the moral-political and moral-combat qualities of the troops and the people in the cause of winning victory over the enemy will have still greater significance.*

This judgment has been repeated frequently in the 1955-59 period. For example, the Soviet military technologist Major General G. Pokrovsky concluded that "atomic weapons create a situation in which the morale factor acts still more strongly than in ordinary war." The demands on the individual soldier and the increased requirements for steadfastness, endurance, and discipline in a nuclear war are clearly recognized by the Soviets.

#### Remaining Factors

The remaining three "permanently-operating factors" of the old thesis require less explanation. The "quantity and quality of divisions" has been interpreted less crudely than, perhaps, was Stalin's original idea and the literal meaning of the phrase. Major General Talensky specifically indicated in the *Encyclopedia* article that it refers to "all arms and components of the armed forces," explaining that the division is "the basic tactical formation, the unit of calculation in the general determination of the relation of forces." This determination of the "relation of forces"

is the basic Soviet military-political strategic estimate of the situation. It is, therefore, possible that this emphasis on counting divisions—and other combat forces in being—may exercise a larger role than in Western calculations.

The fourth factor, "the armament of the army," is (again in General Talensky's words) "one of the decisive factors determining the development of the means and forms of armed conflict." Many writers briefly examine the point. Colonel S. Kozlov published (in 1954) a monograph on "The Armament of the Army—One of the Permanently-Operating Factors Which Decide the Fate of Wars," which discussed the subject at length. Major General A. Lagovsky, in his work "Strategy and Economics," (in 1957) also stressed this factor as well as the continuing decisiveness of basic economic potential.

The above factors ("divisions" and "armament"), together with the ability of the officers corps ("the organizing ability of the command personnel"), form military potential. The term military potential, in the words of Lieutenant General S. Krasil'nikov of the General Staff,

*does not exhaust all of the potentialities of the country for conducting modern war, but is only one of the important items [which compose] these potentialities. The ability of a country to conduct a war depends not only on military potential, but also on economic and political potentialities.*

In particular, in addition to "divisions" and "armament," General Krasil'nikov noted specifically two other elements of military potential: "cadre ground, air, and sea forces," and "trained reserves." One may question the distinction between "divisions" and "cadres," but apparently the latter means the cadre for mobilization of the reserves, in addition to combat-ready divisions (and other units) in being in peacetime. General Krasil'nikov did state

that the Soviet system is best both for "mobilization" and for "retaliation," and this reference may be related to the specification of "cadres" and "divisions" (forces in being). In any case, the major point is clear: *the Soviets believe there is a continuing need for a large combat-ready military force in being, "land, air, and sea," as well as strong readily mobilizable reserves.*

More recently, in an article on "The Essence of Military Potential," in addition to reaffirming the aspects noted, Colonel V. Petrov has also called attention to the fact that:

*The deployment of the armed forces, particularly under circumstances of the wide employment of nuclear weapons delivered by rockets and supersonic jet air power, has a serious importance to the military potential of a country.*

Not only do the Soviets stress armed forces in being, but also appropriately deployed, and finally, supported by adequate reserves.

#### Formula Review

The thesis on the "permanently-operating factors which decide the course and outcome of wars" in its time provided a theoretical concept formulating the main elements of political-morale, economic, and military potential with which to guide the Soviet military leadership in establishing priorities on military development. But in recent years a review of the usefulness of the formula has occurred. The formulation of the thesis itself has now been jettisoned, for two reasons: first, it was a codification made by Stalin and thus served to represent a support for the claims to a perfect Stalinist military science; and second, uncritical parroting of the thesis served to freeze the doctrinal significance of the basic economic, political, morale, and military factors into a stereotyped formula.

Experiments (in 1954 and 1955) with

reviving the real doctrinal essence by calling for a dynamic approach to the thesis have more recently (in 1956, 1957, and 1958) been succeeded by discarding the familiar stereotype and concentrating on the basic factors themselves. This is clearly seen in the review of a book (*Marxism-Leninism on War and the Army*, by Colonel P. A. Chuvikov, revised edition published in 1956) which neglected to keep pace with the evolution of Soviet military doctrinal formulation and repeated the old stereotype. The reviewers (three colonels, all doctors of military science) writing in *Red Star* in February 1957 stated quite frankly:

*Thus the question of the conditions for achieving victory in contemporary war is presented in the book in the old way, as a question of five permanently operating factors. It would be more proper to speak of the morale-political, economic, and military factors, and to attempt to illuminate comprehensively their place in the achievement of victory in war. The author of the book to a notable degree absolutizes the permanently-operating factors.*

In the following month *Red Star* published a key article by Colonel Baz, entitled "V. I. Lenin on the Fundamental Factors Which Decide the Course and Outcome of Wars." What are these new "fundamental factors"? They are the old permanently-operating factors paraphrased and reformulated: the economic and morale basis of the rear, the morale of the armed forces, the quantity and quality of combat technology, and the ability of military men. Now, of course, they are attributed to Lenin (in the style of the new "cult of Lenin"), rather than to Stalin, the author of the old thesis. (The first attempt to shift the credit for the decisive factors partly from Stalin to Lenin had occurred as early as July 1955, when Major V. Zubarev writing in the semiclassified

journal of the Chief Political Administration said that: "Basing on *Leninist* theses . . . J. V. Stalin formulated the general thesis on the permanently-operating factors which determine the course and outcome of war." The same article also credited both Lenin and Stalin with acute awareness of the importance of other factors, including surprise. Finally, the permanently-operating factors were referred to as "Leninist theses on the basic factors of victory in contemporary war.")

And the article by Colonel Baz quite clearly points to the important purpose of the reformulation: namely, the freeing from the old stereotyped formula in order more comprehensively to make use of the practical implications of the decisive factors, and of certain other factors of increased importance, particularly surprise. The key passage reads:

*Nothing would be so dangerous for Soviet military science as a dogmatic interpretation of one or another question of the development of military affairs. We have had attempts to boil all military theory down to the thesis of J. V. Stalin on the permanently-operating factors which decide the course and outcome of wars. This thesis in its foundation does reproduce the Leninist ideas on the conditions for victory over the enemy. However, it does not entirely exhaust the question of factors determining the course and outcome of contemporary war. One could, for example, show that it does not include such very important factors as the training of the troops, their organization, the military art, the state of military theory of the combatant armies, and others. One should also not fail to note that in present conditions the significance of the factor of surprise in particular has grown.*

The new more flexible formulation, begun in 1956, thus continued and became more explicitly the successor to the old

formula. Marshal G. Zhukov in *Red Star* in 1957 stated that:

*The success of war depends on a series of factors, in particular the technical level and condition of the forms of the armed forces [the quantity and quality of divisions; the armament of the army], the combat ability and mastery of the troops, the art of the supreme command, commanders, and operational-tactical officer cadres [the organizing ability of the command personnel], and the main thing—whether the people and the army recognize the just aims of the war because of which the government has led them into the given war [the stability of the rear; the morale of the army]. . . . The factors which have been noted above display their decisive influence on the character of the war and the means of its conduct.*

Marshal Zhukov's words reiterated the elements which constituted the former permanently-operating factors, and clearly expressed the continuing attention to these factors, as can be seen by comparison with the old formulation which is indicated in the bracketed insertions. On another occasion in 1957, Zhukov reiterated that "Success [in war] depends on a series of factors, in particular the technical level and quality of the armed forces, the morale, the combat training and mastery of the troops." Many other Soviet military writers have continued to make similar use of the paraphrased permanently-operating—"fundamental" or "decisive"—factors, with no change in the period since Zhukov's fall. There have even been, in 1957 and 1958, at least six cases where the old formulation of the permanently-operating factors was explicitly and favorably used. Two of these were in military books, and none of the many reviews of these books objected to use of the term. One of the authors, indeed, was promoted from colonel to major general soon after. But, in general, the old restrictive formulation is omitted.

### Old Terminology Renewed

In December 1958 a particularly interesting article, "The Creative Character of Soviet Military Science," by Colonel Sidorenko returned to the use of the term "permanently-operating factor," adding newly stressed additional factors to the category. The entire passage sums up the Soviet view, and is worth our attention.

*The course and outcome of contemporary war depends more than ever before on the economic, morale, and military potentialities of the combatants. This conclusion of V. I. Lenin provides the key to understanding the decisive factors which secure victory in contemporary war. Soviet military science, basing itself on Leninist theses, has extensively revealed the role in war both of the permanently-operating factors, and of the temporary, transitory factors. This is, in particular, borne witness by the well-known statement of J. V. Stalin, set forth in the Order of the Peoples Commissar of Defense of 23 February 1942, speaking of such permanently-operating factors as the stability of the rear, the morale of the army, the quantity and quality of divisions, the armament of the army, and the organizing ability of the command personnel.*

*The thesis on the permanently-operating factors, which generalized Leninist ideas, was at that period a new word in Soviet military science. Under the influence of the cult of the individual, however, this thesis began to be turned into an infallible dogma. Military science, moreover, cannot at all restrict itself to the study of the factors listed. There exist also permanently-operating factors which are not decisive in some cases but can under certain circumstances acquire a determining importance. Among them, for example, are the factors of space or geography, and of time, and a number of others. In addition, one must not ignore factors which are not considered as permanently-operating: surprise, advance preparations for opening*

military operations, and a favorable strategic position. These factors are not operative throughout the entire course of the war, but mainly in its initial period. Their role substantially changes depending on the level of development of military technology. Thus, as a result of the unprecedented progress of contemporary weapons, and above all of nuclear weapons, jet aviation, and missiles, surprise is now in effect already turning into a permanently-operating factor, and that circumstance must be taken into account by military science.

Under contemporary conditions, the role of science and technology grows enormously; without them it would be impossible to advance any field of endeavor, including the military. Hence science too should be added to the list of permanently-operating factors determining the fate of war.

Thus we see that Soviet belief in the continued vitality and decisiveness of the basic economic-morale-military potentials led them to drop the old stereotyped thesis on the permanently-operating factors, so that consideration of the "fundamental" or "decisive" factors themselves, and of other important considerations such as geographical space and surprise, may be more fruitfully examined in military scientific investigations and more usefully applied to practical issues. For, as Major General Lagovsky put it: "All these potentials must be developed and strengthened by all measures since precisely they, in their interrelation, decide the outcome of military operations and consequently of the entire war as a whole."

#### Operational Significance

It is thus clear that Soviet doctrine ascribes decisive importance to the basic military, economic, and morale potentials. It is useful to inquire now into the operational significance of these factors in Soviet thinking and action.

Major General Talensky, in his key ar-

ticle in *Military Thought* in September 1953, indicated the importance attributed when he said:

*Victory in modern war is achieved by a decisive defeat of the enemy . . . on the basis of a superiority in the permanently-operating factors which decide the outcome of wars, on the foundation of an all-sided utilization of the economic, morale-political, and military potentialities in their unity and interrelationship.*

In the discussion which followed General Talensky's article no one challenged this view, and others reiterated it. For example, an air force officer, Colonel E. Chalik, pointed out in *Military Thought* that "Only a state which . . . is capable of creating and maintaining a stable superiority in the permanently-operating factors over the course of a long period is in position to gain victory in contemporary war." The official views expressed in the April 1955 editorial in *Military Thought* closing the theoretical debate of 1953 to 1955 presented this same point in other words.

*Marxism-Leninism places victory in war in dependence upon real, objective conditions, underlining that he wins the war who masters advantages in military, economic, and morale-political potentialities, and who is able to utilize these advantages in the armed conflict.*

These terms of generality are, alone, not significant. The importance of the Soviet view reflected in these generalities is their influence on Soviet military strategy. The basic developments in military technology, political affairs, industrial progress, geographic-strategic changes—these are all specified by the Soviets—determine the economic, military, and morale potentials which must be calculated in the formulation of strategic plans. According to the Soviets military strategy is based on a correct utilization of the permanently-operating factors which decide the fate of wars.



The economic aspect of strategic planning, in particular, has grown. As Major General Lagovsky declared: "The potentialities of strategy now as never before depend upon the planned and accurate functioning of industry and transport." And still more fundamentally: "A strategic plan going beyond the limits of economic potentiality is adventurism. *Strategy not founded in an adequate economic base inevitably will suffer failure.*" Marshal Vasilevsky expressed the same point several years ago, declaring "One can have fine strategic and operational plans and still lose a war, if these plans are not economically supported."

It is evident that the Soviet view of the importance of economic potential in future war is influenced by the Soviet concept that even nuclear war will be a long extended conflict.

#### Economic Support

The importance of economic mobilization and support deserves brief elaboration here. It may be useful also to note its connection with the problem of morale, particularly for a war in which the enemy employs nuclear strategic bombing. As Colonel G. Fedorov stated in *Red Star*:

... wars are now conducted primarily on the basis of that technology, munitions, and all other forms of supply which are produced by the labor of the people in the very course of the war. Hence the degree of labor exertion, self-sacrifice and enthusiasm exhibited by the people in their work to fill the needs of the front, directly and particularly influences the course and outcome of the war. In this, the masses in the rear experience numerous and destructive bombings by enemy aviation, which brings great difficulties and deprivations and makes particularly high demands on morale.

Thus despite the expectation of nuclear bombing, continued military production apparently is anticipated. In fact, although

the Soviets possess enormous stocks of weapons, in the light of the cost and rapid obsolescence of many new weapons, they have even indicated as recently as 1957 that wartime production will remain primary, since even nuclear war will be long and drawn out. Colonel Levanov, in the authoritative military theoretical volume of the Officer's Library, *Marxism-Leninism on War and the Army* (1957), declared that: "In contemporary war reserves of prepared military items do not have as decisive an influence on satisfying the needs of the front as do energy resources, productive capacities, and reserves of strategic raw materials and fuel." Similarly, in another discussion in 1957, Colonel N. Tarasenko stated that: "Under conditions of contemporary war one cannot secure regular supply of weapons, material and supplies only from prepared stocks and reserves. Now the needs of the front can be fully satisfied only as a result of full exploitation of the current military production."

The Soviets, therefore, regard the industrial and transportation preparedness of a state as a key aspect of planning for the eventuality of a long war. As Lieutenant General Krasil'nikov of the General Staff has stated:

*The level of military potential cannot be correctly determined without considering also the degree of preparedness of the industry of a country for mass production of modern armament and combat materiel, and of transport for obtaining uninterrupted supply of everything necessary for the front.*

Finally, in a rare instance of specification of the Soviet strategic planning requirement, Major General Lagovsky has disclosed that: "The fundamental thing that strategy must establish are the requirements of the armed forces for the first year of military operations."

There is evidence indicating that this



strong military concern for providing the industrial capacity for warmaking influenced Soviet military leaders to support the coalition of forces headed by Khrushchev which deposed Malenkov from the premiership in February 1955. At that time, the military were assured that attention would be devoted to heavy industry, and to maintenance of large state reserves of matériel and of products, in order to increase defense capabilities.

#### Vulnerability

Particularly in view of the Soviet attribution to the United States of a proclivity for strategic bombing, one would anticipate keen awareness of the problem of reducing the vulnerability of the Soviet economic war potential. Measures to protect the economy from hostile military action would, it is true, hardly be discussed fully and frankly even in the military press. And, in fact, the only reference prior to 1956 known to the present writer was the statement of Colonel General of Aviation A. Nikitin in *Military Thought* (in 1949) that "Air power has become an effective means of action in the deep rear of the enemy, requiring a reexamination of the question of the distribution of industry."

Nonetheless, serious discussions of "the military economy" (as the Soviets term the military and warmaking aspects of the economic system as a whole) would disclose no secrets in raising the problem of possible contingencies in which the economy could not be counted upon entirely for wartime availability. Yet such an awareness has been remarkably slow in penetrating Soviet military writings on the wartime role of the economy. Soviet discussions of the conversion and mobilization of the economy for war and of the role of "the military economy" which were published in the period through 1955 failed to raise the problem of the vulnerability—and hence even the question of the full availability—of the economy in time of war. The possible effects of nuclear and

thermonuclear bombing, by either side, were ignored as if such a threat did not exist. Discussion of conversion and organization of the economy for war proceeded apparently on the implicit assumption that the peacetime economy would pass relatively unscathed into a new and important career of military service.

This represents a remarkable lack of attention to what would appear to be an obvious and dominating factor. While the earlier articles may be excused, perhaps, for this omission, a number of these discussions date from as late as 1955. To be sure, the fact that discussions of the role of economy in war lagged so strikingly in grasping a simple appreciation of the danger of nuclear attack for the economic system does not reflect a lack of high-level Soviet concern for the strategic defense of the country.

#### Nuclear Devastation

Apparently the earliest Soviet discussion of the role of the economic potential to recognize the effect of possible nuclear devastation appeared only in late 1956. Colonel M. Raitarovsky noted that "under conditions of the employment of new forms of weapons [that is, nuclear weapons, and missile and other delivery systems] transport has to function under great tension," and that "such factors as the territory of a country and geographical distribution of production have great significance." In 1957 and 1958 a few additional discussions have raised this issue. As Major General Lagovsky noted in his important and well-received work on *Strategy and Economics* (1957): "With the probability of employment of the newest weapons against economic targets, defense of one's own economy against hostile actions assumes particularly great significance."

Colonel Raitarovsky, in his initial article on the subject, did raise one key aspect of the problem, and further alleged Soviet superiority in preparing to face the implications of this challenge. He declared

that the United States cannot disperse her industry (60 percent of which is, he says, concentrated in eight northeastern states) because of the opposition of "monopolies."

*On the other hand, our country with its vast spaces and rich natural resources has the opportunity of dispersing its production to make it less vulnerable to [actions of] the enemy, without violating the principle of proximity of production to the sources of raw materials and regions of consumption. Only a socialist government can take on its shoulders such grandiose tasks as the creation in a short period, in the course of the next two or three five-year plans, of a third powerful metallurgical base in the east of the country, with a production [objective] of 15 to 20 million tons of iron per year.*

Whether the Soviets are really so sanguine about their ability successfully to avert devastation may be doubted, but the scope of the effort as outlined marks it as a serious one. Similarly, it is known that industrial expansion in the USSR has for some time been ordered to follow dispersal and avoidance of present urban-industrial centers, in particular Moscow and Leningrad. More recently, 1957 and 1958, the industrial reorganization and general decentralization of the Soviet economy into about 100 "economic councils" has provided a much more viable basis for meeting the needs of nuclear war. Indeed, in November 1957, Khrushchev himself declared in *Pravda* that: "The reorganization of the direction of industry which we have undertaken also creates a more autonomous management of industry. That, too, improves our strategic position." He declared that while this was "not the main aim of the reorganization, it is nonetheless a very considerable one."

It is not necessary here to examine the question of Soviet views on the relative importance of attacking the enemy's economy, save to note that while raising the

importance of this mission they have continued to hold to the strategic concept of victory ultimately through destruction of the enemy's armed forces rather than of his warmaking capacities.

### Potential of Morale

The second major component of power considered crucial for war is the morale potential. As Colonel Baz put it (June 1958) in the *Military Herald*:

*But this [the economic factor] is only one aspect of the question of the decisive role of the rear in contemporary war. Another no less important aspect concerns the ever growing dependence of the armed conflict and war as a whole on the state of morale both of the armed forces and of the whole population. The morale factor has always played a decisive role in wars. . . . Future wars will demand unprecedented intensity of all strengths, physical and morale, of all categories of personnel of the armed forces and of the population.*

This evaluation reflects the long-standing Soviet concept according to Colonel G. Shabaev that: "The morale factor is considered in inseparable conjunction with the economic and other factors which decide the outcome of wars." Consequently, as Marshal Vasilevsky once noted in *Red Star*:

*One can lose a war, despite the existence of excellent strategic plans which are economically well supported, if the war aims are unfavorable for maintaining the morale of the people on a high level for a long period of time.*

We have seen earlier that the Soviets ascribe still greater importance to morale in nuclear war than ever before. One aspect of Soviet morale in a future war is of particular interest. It is, moreover, one which the Soviet leadership did not openly discuss until 1955. Would Soviet armies, would the Soviet soldier, fight as

courageously and as well in a war on foreign soil as in defense of the earth of Russia? The question is not susceptible of definite answer, but it is possibly a very important one. The editorial in *Military Thought* for May 1955 first broached this subject, indirectly, stating:

*In further working out the questions of the morale factor in war it is necessary to attain an ability to calculate and to utilize realistically all its potentialities in the interests of the military art and the achievement of victory over the foe . . . [political instruction] in the spirit of conducting active offensive operations directed toward the complete crushing and annihilation of the enemy, assumes particularly important significance.*

Very soon following this article, a Soviet military "specialist" on the role of morale, Colonel Kashirin, broached the issue in *Red Star* as follows:

*The Soviet state is a peaceful state . . . But that does not mean that if the imperialists unleash a war, attack the Soviet Union, that the Soviet armed forces cannot conduct military operations on the territory of the enemy . . . Unfortunately, some of us often confuse two entirely different conceptions. This is explained by the fact that there exist among us military comrades of the opinion that in the case of an attack on us of imperialist aggressors our mission will be to defend, to repulse their attack, not to permit them to enter deep in our country—and only that.*

This view, he explains, is faulty and dangerous.

*And if it is necessary to advance on the territory of other states, not in order to seize their territories, to suppress some people, but in order to destroy barbarous imperialist robbers, to defend to the end the state interests of the U.S.S.R. . . . this requires of the entire personnel of*

*the Soviet armed forces high morale qualities.*

It is, indeed, surprising to learn that some "military comrades" were so naive and so bold as to maintain that in the event of war the Soviet armed forces should not attempt to advance into other countries. And it is revealing that the justification is framed in terms of "the state interests of the U.S.S.R."—something no one is likely to question.

Following the use of Soviet troops to put down the Hungarian Revolution in November 1956, this theme of advancing into other countries again became too sensitive to reach the open military press.

While the Soviets constantly proclaim their great superiority in morale, it is likely that the Soviet leaders are concerned over the problem of how the Soviet and satellite peoples would act in war—especially in war initiated by the Soviet Union. It may be that despite their extensive and intensive efforts to propagandize their soldiers and general population they consider this to be an element in restraining them from war.

#### Military Potential

Now we reach the third major component of war-waging power—the direct military potential. Military potential is defined by the Soviets to embrace the quantity, quality, deployment, and reserves of military manpower and weapons. Colonel Petrov, in a recent (mid-1958) article "On the Nature of Military Potential," reviews these factors with especial stress on training and preparation of the officer cadres. He also includes attention to the level of military science as a relevant factor.

The continuing Soviet emphasis on successive campaigns has been indicated. According to Colonel Levanov: "The fate of war cannot be decided by one or two engagements, no matter how grandiose a scale they might achieve. Contemporary wars assume a drawn-out character." Con-

sequently, as Major General Talensky has recently (1958) stated: "Victory in war will now be achieved by means of determined armed struggle, by means of dealing the enemy blows mounting in strength, and the organization for that purpose of all the forces of the people and all the resources of the country." And, as he noted on another occasion, "under contemporary conditions no major war against an economically powerful adversary can be won unless it is possible to step up the war effort continuously."

The importance of the economic potential for direct support of military operations is again emphasized. It is considered by the Soviets to be of such exceptional importance because of their image of a future nuclear war with large armies committed over vast territories for a long period of time. It is useful to cite a few statements from recent years illustrating the Soviet attention to the industrial base for armaments.

As Colonel Z. Osipov expressed it:

*At the present time wars have a long, drawn-out character, they have an unprecedented scale in numbers of participants of the armed forces and the saturation of their materiel. They make tremendous demands on the armament and munitions supply and production, and require high morale and combat qualities of the personnel of the army.*

Major General Pokrovsky pointed out that:

*Armament depends upon the level of development of productive forces achieved at any given time, the industrial might of a country which permits supplying new forms of armament to mass armies. Contemporary armies, gigantic in their scale, would be unthinkable in the absence of mass production of weapons.*

And according to Major General E. Razin:

*In contemporary war superiority over the enemy in artillery, tanks, aircraft of all types, automatic weapons, new weapons, and in general superiority in military technology as a whole, has important significance. In this connection mobilization and deployment of industry, especially of heavy industry, plays a decisive role.*

And similarly for transportation facilities, Lieutenant Colonel M. Shirokov stated that:

*The concentration of a very large number of troops in definite sectors, with their large quantity of materiel, the necessity of constant supply to these troops of all forms of goods and reinforcements, places the question of mobilization of all forms of transport particularly sharply.*

#### Manpower

The other essential ingredient of the military forces is, of course, manpower. And first of all in terms of direct military potential, Lieutenant General Krasil'nikov declared: "The size of the population and its political-morale condition determine the possible limits of its military training reserves." Moreover, in strategic planning special attention is given to preparation of adequate reserves in expectation of a long war. Thus in the 1957 volume of *Marxism-Leninism on War and the Army* the military requirement for planning for a long war is stated by Colonel A. V. Zakharov as follows:

*In the strategic planning of war the correct employment of the troops must be estimated not only for its initial period but for its whole course. A genuinely scientific approach to the determination of the sizes of the first and succeeding strategic echelons, tempos of mobilization and strategic deployment, force levels of ready and reserve forces, reinforcement of combat field formations with fresh forces during the whole extent of the war is required. Hence Soviet military science at-*

*taches enormous significance to the working out of these problems. A correct decision on these problems determines the effectiveness of the employment of the quantity and quality of the armed forces in the interests of victory in war.*

Other writers too have stressed, in the words of Colonel General P. Kurochkin in *Military Thought*, that the possession and proper deployment of strategic reserves is "one of the most important factors for seizing the strategic initiative from the hands of the enemy."

The Soviet "annual class" conscription system (and the practice of geographically and occupationally settling many discharged conscripts at the close of their service by groups) ensures a strong reservoir of trained manpower reserves.

The Soviet conception of future war decided by economic, morale, and military potentials also leads them to plan on the basis of large, mass ground armies. Marshal Zhukov (in 1956 and 1957) provided several clear statements of the Soviet view on the role of large ground forces. After denying that air and nuclear power is now the predominant type of armed force in war, he stated in *Pravda* that mass armies are necessary even in general nuclear war:

*Air power and nuclear weapons by themselves cannot decide the outcome of armed conflict. Along with atomic and hydrogen weapons, in spite of their tremendous destructive power, large armies and a tremendous quantity of conventional arms inevitably will be drawn into military operations.*

Nor is this a statement designed simply for Western consumption. Soviet military writing is replete with similar statements reflecting this key conclusion of Soviet military thinking.

In fact, in the period since 1956, several Soviet military men have explicitly declared that "The use of nuclear weapons not only does not replace conventional

armed forces, but on the contrary leads to their increase." Colonel Baz, writing the above sentence in the *Military Herald* in mid-1958, continued to explain the Soviet reason for that conclusion:

*Means of mass destruction are so termed because their employment causes great losses. The dispersal of troops with their subsequent swift concentration on the front line and in depth is the logical consequence and inevitable result of the appearance of atomic and hydrogen weapons, and will be standard in future war. But the losses among the troops will just the same be very great. It is necessary to orient ourselves not on an easy war, but on an extremely severe war which will require throughout its whole course tremendous reinforcements for the armed forces. The possibility of great losses leads also to the substantial growth of reserves—strategic, operational, and tactical—which will in future war in much greater degree than in previous wars be assigned to replace troops knocked out of the line. Thus one must not expect in future war with mass destruction weapons any lessening or reduction of armed forces by any means, but on the contrary their further increase.*

Thus forces in being sufficient to serve both as immediately available forces to seize the initiative on the ground to advance, and as cadre for rapid expansion by integration of trained reserves, and large reserves to replace those destroyed in nuclear war, are a requirement established by Soviet doctrine in accordance with their image of future extended war.

### Conclusion

Thus we see in summary that in the Soviet view pointed out by Major General Lagovsky: "Only by commanding a superiority in the forces flowing from the constant interaction of these [military, economic, and morale] potentials as a whole can one count on success in armed conflict."

Soviet military doctrine and strategic thinking reflects the Marxist view of history, as expressed by Colonel General A. Zheltov, "victory cannot be won by any easy means." Moreover, their basic philosophy of war as a means to political ends leads them to visualize their strategic objective in war as the conquest of other assets—not the reduction to radioactive ash of the resources of others and of themselves. But beyond the influences of their ideological dispositions and political objectives, their military strategic concept sees victory won only through the

destruction of opposing military power in what they calculate will be a long, hard, worldwide war requiring large ground armies, tense morale demands, and an all-encompassing economic effort.

The Soviets not only have developed their doctrine in terms of this view, but they have shaped the organization, composition, nature, and size of their armed forces accordingly. Soviet doctrine on the decisive factors in a war is not only evidenced in their military writings, but is borne witness to by the entire Soviet military establishment.

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... it is in the technological field of ultramodern weapons and satellites that the Soviets seem to have expended their greatest efforts and in which they have recently scored significant successes. We have observed their feverish activity in the missile field, both surface-to-surface and surface-to-air. We are sure that they have integrated missiles into their ground and air forces in the role both of surface artillery and antiaircraft artillery. All across the board of Soviet military preparations, there is evidence that the development of preponderant military strength for the imposition of Soviet policy is a primary national objective. For the accomplishment of this objective they appear willing to expend virtually unlimited effort. Finally, they are equally well-prepared to fight an atomic or nonatomic war.

*General Maxwell D. Taylor*



# THE ARMY SYSTEM OF FALLOUT PREDICTION

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*This article is in consonance with current doctrine as taught at the U. S. Army Command and General Staff College.—Editor.*

## FALLOUT!

A high-pitched yell from the monitor was the first knowledge the commanding officer of the 2d Battle Group, 20th Infantry, had of the expected presence of fallout in his area. In addition to the problem of continuing what now appeared to be a successful attack and completion of his mission, many other thoughts raced through his mind. Where did it come from? There had been no nuclear bursts in the immediate area, only one against the left flank division several hours ago.

Communications were in, yet no word had been received from division of fallout in our area. Over what area can we expect fallout? How hot will it be? How will it affect the accomplishment of my mission? Now that fallout has started, how long will it last?

No prediction system existing today can answer all of the questions that a commander might have with regard to fallout. The United States Army prediction system does answer many of these questions and is a distinctive aid in planning for the employment of nuclear weapons. This prediction system defines the best estimate available of the area within which significant fallout might be expected. It is an envelope type system and no attempt is made

to establish dose rate contours or relative risk areas at this time. Additional work on these problems presently is being carried out under the direction of the US Continental Army Command (USCON-ARC).

In order for commanders and staff officers to understand the proper use of the present system, together with any further developments, they need a basic knowledge of how the present prediction system works. The US Army is continuously reviewing this fallout prediction system in an effort to determine means of increasing its reliability and adequacy for combat use.

### Meteorological Data

Any system of fallout prediction must, to some extent, be based on tracing the path of one or more sizes of fallout particles to find where they will fall on the ground. The wind structure between the source of the particles (the nuclear cloud) and the ground is the most important factor in determining where fallout will occur. With present prediction methods it is necessary to have available the best possible description of the winds aloft to determine the arrival points of fallout particles of various sizes originating at various altitudes. This information is furnished through intelligence channels, and may originate in the weather bureau, air weather service units, or Army meteorological units organic to the artillery.

The corps artillery meteorological section provides the Fire Support Coordina-

***The United States Army fallout prediction system answers many of the questions which a commander may have with regard to fallout and is a distinctive aid in planning for the employment of nuclear weapons***



tion Centers within the corps the following data:

1. To 102,000 feet (or to the bursting altitude of the weather balloon, provided this altitude is at least 78,000 feet) at 0600, 1200, 1800, and 2400 daily, information relative to average winds for each 6,000-foot layer above meteorological station altitude to include wind speed in miles an hour and wind direction in degrees or mils, to the nearest five degrees.

In addition, data is obtained on pressure, temperature, and relative humidity at significant levels. A significant level is any level in the atmosphere at which a significant weather change occurs.

2. To 60,000 feet at 0200, 0400, 0800, 1000, 1400, 1600, 2000, and 2200 daily, the same data as listed above. (This is also within the capabilities of the division artillery meteorological section.)

### Particle Distribution

Studies of test data indicate that the particles which produce tactically significant radiation on the ground range in size from about 75 to 1,000 microns, with 150 to 500 microns being most significant. (One micron = .001 millimeter.) Particles of 1,000 microns and larger size are thought to originate mostly in the stem and the bottom of the cloud directly above the stem. These particles usually fall out into the area around ground zero. Particles from 500 to 1,000 microns in size are thought to originate mostly in the inner

50 percent of the lower half of the cloud. The fallout of these particles extends from ground zero in the downwind direction. The lighter particles are scattered throughout the cloud and fall on the ground at greater distances from ground zero.

The rate at which particles fall influences their displacement by the winds acting upon them as they fall to the ground. The rate of fall depends principally on particle size and weight and on air density. It follows then that the rates of fall change with altitude.

### General Technique

The Army method of fallout prediction is flexible since it can be used to prepare an area envelope based on:

1. No input data at all.
2. Estimated input data.
3. Measured or reliable input data.

The reliability of the end product is dependent upon the quality of the available data. In general, the method depends primarily on a fallout wind plot which is a continuously maintained wind vector diagram based upon current weather data. The yield and cloud dimensions from surface bursts are determined or estimated, and an *envelope* is drawn, based on the fallout wind plot, to outline the estimated outer limit of the area of contamination. Earliest times of arrival points then are calculated and superimposed on the plot, and the angular direction variability of the wind is determined and noted on the plot. Optional features such as inclusion of the hot line, the probable time of ending of fallout, and the sector of airborne radioactivity which may be of interest to aircraft or which may be affected by rainout are included in the method for use by the predictor as desired or required.

### Detailed Description

*The wind vector plot.*—The plot is made as an overlay to an appropriate map scale. The plot begins at any convenient point. Successive vectors for each wind layer are

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laid off from the downwind end of the preceding vector, starting with the lowest wind layer and working upward. The direction of each vector is the same as the wind direction for that layer; the length of the vector is the product of the wind speed and the factor presented in Figure 1. The product of speed and this factor gives a distance in miles which is plotted

as the proper map distance. The factors in Figure 1 are proportional to the time of fall through the layers for a standard particle which require three hours to fall from 36,000 feet to the ground. The end of each vector is labeled by the height of the top of the layer it represents, in thousands of feet. The height of the tropopause is marked and labeled T.

<i>From</i>	<i>Wind layer (feet)</i>	<i>To</i>	<i>Multiply wind speed by</i>
0		6,000	0.61
6,000		12,000	0.55
12,000		18,000	0.50
18,000		24,000	0.47
24,000		30,000	0.44
30,000		36,000	0.42
36,000		42,000	0.40
42,000		48,000	0.38
48,000		54,000	0.36
54,000		60,000	0.35
60,000		66,000	0.34
66,000		72,000	0.34
72,000		78,000	0.33
78,000		84,000	0.33
84,000		90,000	0.32
90,000		96,000	0.32
96,000		102,000	0.31
102,000		108,000	0.31
108,000		114,000	0.30
114,000		120,000	0.30

Figure 1. Weighting factors for use in preparing fallout wind plots

For example, assume that the following meteorological data has been received:

<i>Altitude layer (thousands of feet)</i>	<i>Wind direction (degrees)</i>	<i>Wind speed (MPH)</i>
0-6	070	10
6-12	080	15
12-18	090	20
18-24	100	15
24-30	110	10
30-36	130	10
36-42	160	15
42-48	180	15
48-54	200	20
54-60	210	15

Tropopause: 40,000 feet.

The wind vector plot would then be as shown in Figure 2.

ground zero to each 6,000-foot altitude point on the wind vector plot. This completes the fallout wind plot.

*Height lines.*—Lines are drawn from

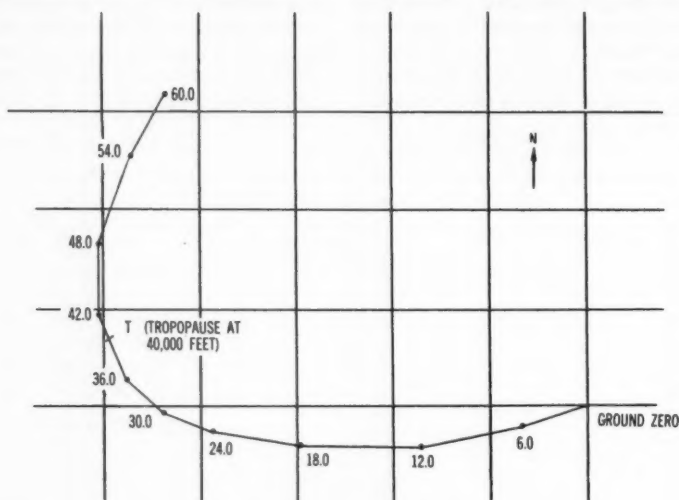


FIGURE 2. WIND VECTOR PLOT

Yield (KT)	Height of cloud				Radius (Meters)
	Top		Bottom		
	Feet	Meters	Feet	Meters	
0.5	9,000	2,700	7,000	2,100	700
1	11,000	3,300	8,000	2,400	900
2	15,000	4,600	12,000	3,700	1,200
5	23,000	7,000	18,000	5,500	1,700
10	27,000	8,200	22,000	6,700	2,300
20	33,000	10,000	27,000	8,200	3,100
50	41,000	12,500	32,000	9,800	4,600
100	48,000	14,600	36,000	11,000	6,100
200	56,000	17,000	39,000	12,000	8,000
500	62,000	19,000	43,000	13,000	12,000
1,000	69,000	21,000	47,000	14,500	16,000
2,000	75,000	23,000	49,000	15,000	22,000
5,000	90,000	27,000	53,000	16,000	29,000

Figure 3. Cloud dimensions

*Cloud top height and radius.*—The cloud top height is marked on the fallout wind plot. The cloud top height and radius are determined as follows:

1. When the yield is known or can be estimated in any way, the cloud top height and radius are taken from Figure 3.

3. Measured cloud diameter 6.3 kilometers (radius, 3.15 kilometers).

The wind vector plot would then appear as indicated in Figure 4.

*Effective wind speed.*—To determine the effective wind speed, on the wind vector plot measure the straight line distance

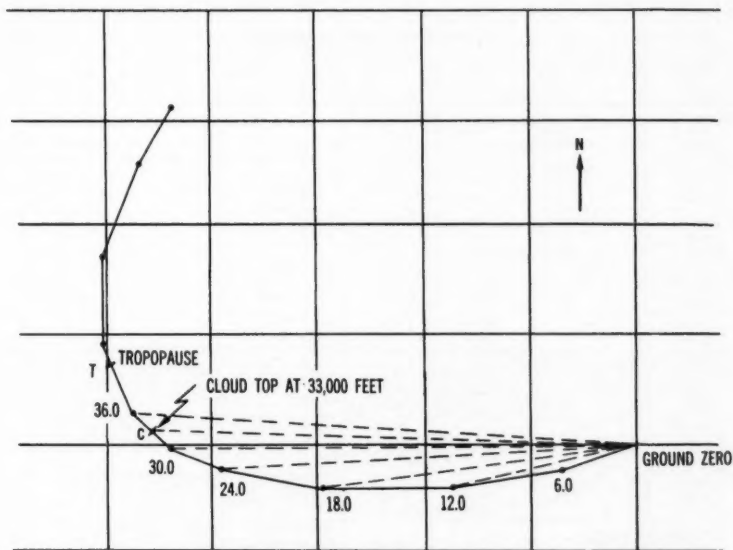


FIGURE 4. MODIFIED WIND VECTOR PLOT

2. When the cloud top height and radius can be measured, these values will be used.

As an example, assume the following information:

1. Nuclear weapon burst on the surface, yield unknown.
2. Measured height of cloud: 33,000 feet.

from the point representing ground zero to the point representing the cloud top. Multiply this distance (in miles) by two, and divide by the number of vectors (between ground zero and top of cloud). The resulting number is the effective wind speed in miles per hour. If only a portion

of a vector is involved, include it as though it were a whole vector.

**Modification of height lines.**—All height lines (up to and including that of the cloud top) are shortened or extended to a length that is the product of the original length and a multiplying factor. The factor to be used is found in Figure 5. It is depend-

sumed to be a surface burst. If the yield is unknown, a yield is assumed based on operational experience and known enemy capability. When the weapon is burst above the height shown in Figure 5, the weapon is presumed to produce no fallout of military significance.

In this example the effective wind speed

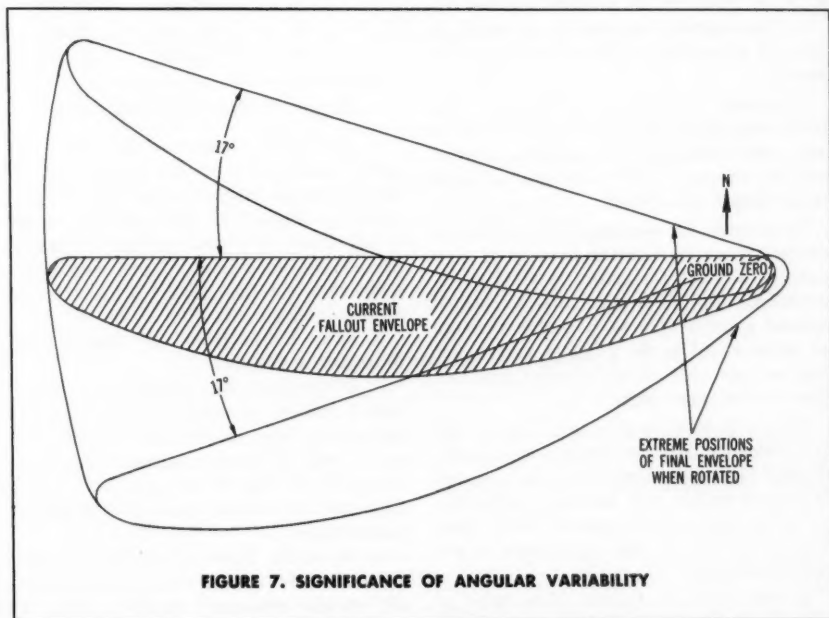
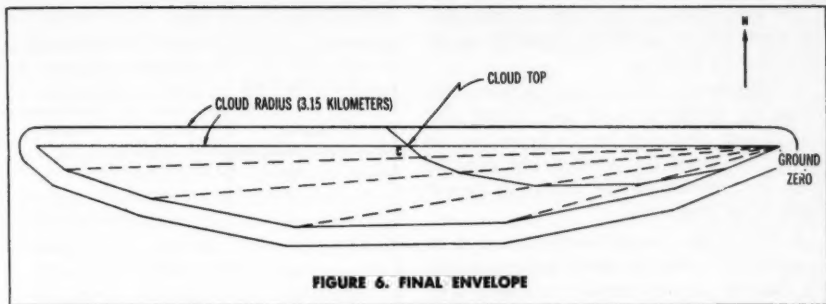
Yield (KT)	Effective wind MPH	Yield weighting factor for two surface burst	In body of table read appropriate height of burst brackets (in meters): on top line of same column, read yield weighting factor																	
			9	0.35	0.31	0.30	0.275	1.00	1.25	1.50	2.00	2.50	3.00	3.50	4.00	5.00	6.00	7.00	8.00	
ALPHA 0.5	Under 15	1.00	Over 23	23-19	—	18-10	9-4	3-0												
	15-30	0.75		23-16	—	15-6	5-0													
	Over 30	0.50		23-13	12-7	6-0	—													
BRAVO 1	Under 15	1.00	Over 30	30-25	—	24-15	14-5	4-0												
	15-30	0.75		30-22	—	21-9	8-0													
	Over 30	0.50		30-17	16-10	9-0	—													
CHARLIE 2	Under 15	1.00	Over 38	38-33	—	32-23	22-12	11-0												
	15-30	0.75		38-29	—	28-15	14-0	—												
	Over 30	0.75		38-24	23-17	16-3	2-0	—												
DELTA 5	Under 15	1.50	Over 52	52-42	—	41-39	38-28	27-10	—	9-0										
	15-30	1.00		52-43	—	41-29	28-9	8-0	—											
	Over 30	0.75		52-37	36-30	29-12	11-0	—												
ECHO 10	Under 15	1.50	Over 65	65-61	—	60-54	53-42	41-28	—	27-0										
	15-30	1.50		65-57	—	56-43	43-24	32-4	—	3-0										
	Over 30	0.75		65-51	50-44	43-28	27-0	—												
FOXTROT 20	Under 15	2.00	Over 82	82-78	—	77-70	69-59	58-49	—	48-18	17-0									
	15-30	1.50		82-75	—	74-61	60-43	42-31	—	20-0	—									
	Over 30	1.00		82-67	66-60	59-45	44-7	6-0	—											
GOLF 50	Under 15	3.00	Over 110	—	—	110-100	99-87	86-80	—	79-54	53-17	—	16-0							
	15-30	1.50		—	—	110-92	91-76	75-50	—	49-0	—									
	Over 30	1.00		110-95	94-88	87-73	73-36	35-0	—											
HOTEL 100	Under 15	3.00	Over 140	—	—	140-128	127-115	114-107	—	106-87	86-54	—	53-0							
	15-30	2.00		—	—	140-124	123-108	107-77	—	76-52	21-0	—								
	Over 30	1.25		140-123	123-117	116-104	108-69	68-19	18-0	—										
INDIA 200	Under 15	4.00	Over 330	—	—	—	—	330-265	—	264-241	240-183	—	182-41	—	40-1					
	15-30	2.00		—	—	330-302	—	301-230	—	219-114	113-0	—								
	Over 30	1.50		—	—	330-268	267-202	201-118	—	117-0	—									
JULIETT 500	Under 15	4.00	Over 445	—	—	—	—	445-405	—	404-366	365-329	—	328-180	—	179-0					
	15-30	2.50		—	—	445-420	—	419-350	—	349-254	253-97	96-0	—							
	Over 30	2.00		—	—	445-381	380-326	325-247	—	246-33	32-0	—								
KILO 1,000	Under 15	5.00	Over 560	—	—	—	—	—	—	560-500	500-464	—	463-326	—	325-133	133-0				
	15-30	3.00		—	—	—	—	—	560-498	—	487-396	396-366	365-88	87-0	—					
	Over 30	2.00		—	—	560-508	508-433	432-369	—	368-152	151-0	—								
LIMA 2,000	Under 15	6.00	Over 710	—	—	—	—	—	—	710-671	670-610	—	609-519	—	518-372	371-137	136-0			
	15-30	4.00		—	—	—	—	—	710-646	—	645-549	548-442	441-288	287-40	—	59-0	—			
	Over 30	2.50		—	—	710-671	670-579	578-505	—	503-320	319-32	31-0	—							
MIKE 5,000	Under 15	8.00	Over 950	—	—	—	—	—	—	950-915	—	—	914-840	—	839-685	684-518	517-296	297-46	45-0	
	15-30	4.00		—	—	—	—	—	950-915	—	914-813	812-732	731-595	594-427	—	436-0	—			
	Over 30	2.50		—	—	—	950-864	863-763	—	761-610	609-342	341-0	—							

Figure 5. Yield weighting factors

ent on the weapon yield and the effective wind speed. To find this factor, enter Figure 5, with the yield and effective wind speed (in first vertical column); move horizontally to the right to the proper height of burst; move vertically to the top of the table and read the appropriate factor. If the height of burst is unknown, it is as-

sumed to be 12 miles an hour. Since the yield is unknown but the height of the cloud top and cloud radius are known, the yield can be estimated to be 20 kilotons (Figure 3). The yield weighting factor is then determined to be two (Figure 5).

**Preliminary envelope.**—The preliminary envelope is represented by the outermost



lines (perimeter of the plot as a whole) after the following action is completed: a line is drawn from ground zero to the end of the first modified height line; from there to the end of the second; from there to the end of the third, and so on, until the end of the last height line is reached; then

from there back to ground zero.

*Final envelope.*—The final envelope is drawn one cloud radius outside of the preliminary envelope. The envelope should include all lines just drawn and all height lines. The plot will then be as shown in Figure 6.

### Angular Variability

**Determination.**—The angular variability applicable to a fallout prediction is determined as follows:

1. Determine the angles between the cloud top height lines of the current plot and of each past plot for the preceding six hours. The same cloud top height must be used in determining the cloud top height lines to be compared.

2. Select the largest angle obtained in 1, above. This will be the angular variability for the current prediction unless it is less than 10 degrees, in which case 10 degrees is used as the angular variability.

3. The angular variability is stated as plus or minus the angle determined in 2, above.

**Significance of angular variability.**—The final envelope, oriented on the current wind plot, represents the most probable location and boundary of the outer limit of militarily significant fallout.

To account for possible shifts in the direction of winds with the passage of time (and to account for errors in wind measurement), the final envelope is rotated around ground zero as a center through an angle equal to the angular variability, first on one side of its original position, then on the other side.

Thus although the size and shape of the final envelope does not change, it is operationally significant that it may be oriented anywhere within one angular variability on either side of the current wind plot. Figure 7 illustrates the significance of angular variability.

**Arrival time of fallout.**—The time of arrival of fallout may be estimated as follows, preferably on an overlay separate from the fallout plot itself.

This procedure will give the time of arrival of a nominal size particle from the center of the cloud. The calculation is based on the data in Figure 8 which gives fall times from various altitudes for a particle

with a fall rate of about 12,000 feet/hour in the lower 36,000 feet.

Arrival time (hours after burst)	Height at which fallout originates	
	(feet)	(meters)
0	0	0
1	10,000	3,050
2	22,000	6,700
3	36,000	11,000
4	52,000	15,800
5	69,000	21,000
6	87,000	26,500
7	107,000	32,600
8	127,000	38,800
9	147,000	45,800

Figure 8. Fallout arrival times

1. By visual interpolation along the wind vectors of the wind vector plot, determine points corresponding to the heights listed in Figure 8. The greatest height which should be plotted is that which first exceeds the cloud height. Label each height point thus obtained with the arrival time corresponding to it.

2. Draw a line from each height point to ground zero.

3. Divide each line drawn in 2, above, into a number of equal segments equal to the arrival time at its end. The dividing points between these segments represent times of arrival of 0, 1, 2, . . . hours after the detonation, starting with zero at ground zero.

4. To obtain times of arrival at more distant points, extend each line and mark off, on the extension, segments equal to those determined in 3, above.

5. Connect all points representing the same time of arrival.

If the time of arrival from the leading edge of the cloud is desired, draw a new line parallel to each line obtained in subparagraph 5, above, and a distance of one cloud radius farther from ground zero.



The arrival time overlay will be as shown in Figure 9.

The arrival time overlay then is used in conjunction with the fallout envelope to show the entire picture of the predicted area of fallout.

#### Optional Refinements

The following refinements may be made in the basic fallout prediction method:

**Determination of a line of maximum intensity.**—Since the intensities are not uniform throughout the area inclosed by the fallout plot, it sometimes is valuable to

zero from the original arrival time lines.

**Airborne activity and rainout.**—Aircraft may become contaminated by airborne activity anywhere in the angular sector containing the fallout wind plot and extended laterally by one cloud radius. Aircraft also may become contaminated throughout an adjacent area through which radioactive particles originating at higher altitudes fall before reaching the ground. This area can be predicted in the same manner except that the wind vector plot is prepared by working from the cloud

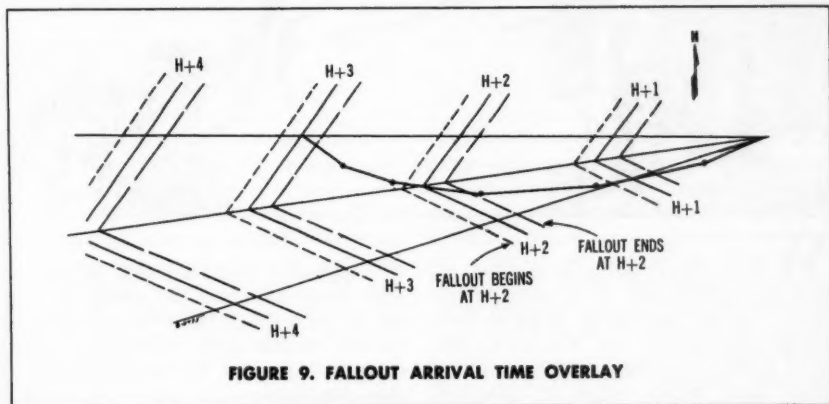


FIGURE 9. FALLOUT ARRIVAL TIME OVERLAY

have a predicted hot line. In many cases the hot line can be approximated by plotting a line from ground zero to the point on the fallout wind plot that defines the altitude from the surface to a height three-quarters of the way from the ground to the top of the cloud. This method of determining the hot line is most valid for yields above 100 kilotons. For lower yield weapons it is less accurate.

**Prediction of probable time of ending of fallout.**—To predict the probable time of ending of fallout, proceed as in determining the time of arrival, with the exception that the time of ending contours is drawn one cloud radius toward ground

top to the ground, rather than from the ground to the cloud top. Aircraft passing through either of these areas may become contaminated.

#### Conclusion

An understanding of the Army prediction system of fallout together with the immediate dissemination of the fallout plot in accordance with existing standing operating procedure can materially alleviate the situation stated at the beginning of this article. It will answer many of the commander's questions and allow him to plan his operations in such a manner that fallout will have the minimum effect on the accomplishment of the mission.

# CROWD THEM WITH RIFLES

Lieutenant Colonel Anthony L. Wermuth, *Infantry*  
Student, United States Army War College



**W**ELL-TRAINED and well-led infantry doesn't bunch up. Conversely, one always hopes that enemy infantry isn't trained well enough; that it hasn't enough good leaders; and that it will, sooner or later, mass within range of direct-fire weapons. In the nuclear era a great deal of ingenuity will be devoted to devising ways to make the enemy concentrate without doing it ourselves.

For several years much of the speculation about how a unit will fight on the nuclear battlefield has belabored the necessity of creating a profitable nuclear target. We have to make the enemy mass, we are assured, and after we do that we have to move fast ourselves. That is to say, that a unit which normally will be

in a dispersed formation will be able to stay dispersed while the enemy unit is forced to mass. Causing, or at least observing, his unwise move, we explode a nuclear round on him. In order to cause further devastation and exploit the nuclear attack, we concentrate our infantry. And then, having chewed up the survivors of the nuclear blast, we rapidly disperse our forces again to avoid presenting a nuclear target of our own.

As far as troop targets are concerned, only massed troops, it is said, make it economically worthwhile to expend a nuclear round. This will not, of course, preclude using one anyway should a mission make it militarily, if not economically, worthwhile. While the size of the unit that

*There have been many methods advanced to cause the enemy to mass his troops and thus provide a nuclear target, but the one most calculated to achieve this objective is infantry and its direct-fire weapons*

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makes the expenditure worthwhile may move down the scale (battle group, company, platoon) as nuclear weapons become more plentiful, it probably can be expected for years to come that the dollar-cost of such weapons will preclude their being expended lavishly.

Therefore, for the same period, the requirement to force the enemy to mass probably will continue to be valid. But how to cause this? Obstacles? Minefields? Artillery? All of these, and others, given the right circumstances can force the enemy to mass. All of them complement each other.

### Primary Means

*It is contended here that the primary means of making an armed force mass is massed infantry.* It has been said that on the nuclear battlefield ground in itself will be unimportant; however, this claim is suspect. It may be true concerning many pieces of ground, but in that general sense the assertion always has been true. It is important, however, to identify *what* piece of ground. Great installations such as cities cannot be moved, nuclear age or not; and ground which is essential to the defense of such key points will be important and may have to be held.

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To defend and hold specific ground still will require that men be placed on it or near enough to control it at crucial times. We might as well face the fact that seldom will we be able to drop a nuclear round on an enemy before we mass our own forces. *It will become necessary in certain circumstances to mass ourselves in order to make the enemy mass.*

Actually, there are two major elements that force massing: time, and small arms fire. All the other ways discussed from time to time will not in themselves force massing. In order to work, they must be harnessed with the time element. For example, it is often set forth that a narrow defile, manmade or natural, or an obstacle such as a river will force troops to mass. However, if they have time, this it not true since they can go around the obstacle in dispersed formation, however difficult the going may be. They can also proceed through the defile or over the river in small numbers or groups, even single file, if need be, and thus pass the obstacle without massing. As a practical matter, of course, units seldom have time to proceed single file on *any* kind of battlefield; yet it should be realized that it is the added demand of time, not only the obstacle itself, that accomplishes whatever massing may be forced.

Similarly, if there is a reasonable allotment of time and the obstacle is undefended by small arms, any obstacle can be overcome, or destroyed, or removed, or penetrated, or crossed by troops who need not mass to effect their passage.

If the obstacle is defended only by artillery, troops certainly do not need to mass to pass through it. The general effect of artillery is to make troops disperse, not mass. They certainly can pass through it, for artillery cannot deny ground to troops willing to pay the price of passage. Some proportion will always get through; no experienced artilleryman would assert otherwise.

### Radiological Contamination

One especially effective form of denial is possible through radiological contamination, in the special sense that, unlike a river or chasm or other obstacle where passage, although enormously difficult, might still be possible, contaminated ground cannot be passed over (with ground contact) at all. To be sure, some means of passing over such areas in dispersed formations or in vehicles may someday be developed. In the meantime, however, it can be agreed that contaminated areas constitute effective barriers to troop passage, and hence are inducements to concentrate in order to get through whatever corridors are set up through the contaminated areas. There would be no way to "go around" them, no matter how much time one had. As understood today, however, radiological contamination is likely to be a two-edged sword, to hurt the user as well as his target; in any event, it does not appear likely to be used very freely or often.

One cannot ignore the tactic by which the enemy, instead of going through or around our position, will go through the air over the position. A genuine possibility, obviously, but requiring conditions such as the proper aircraft, good weather, and success despite ground and air fire. Undoubtedly, if the enemy has this means available, he will use it. But what if he can't? What if the air is uninhabitable for manned aircraft?

In order to force massing, all of the foregoing means have to be teamed up with either time—in the sense of limited time—or defense by small arms. But even the urgency of limited time is relative, and often is an artificially imposed requirement—"artificial" in that someone up the line may have said, "I want it done in four days," instead of six days. However, there is nothing artificial about the direct fire

of massed small arms. Generally speaking, a defense featuring heavy-volume direct fire cannot be coped with short of massing, and the enemy's massing enables him in turn to mass *his* direct fire in large volume as the indispensable countermeasure. The winner, given equal strength, is the side that used the fire and supporting weapons to best advantage. Hence we are enabled to say that the means *most likely* to force the enemy to mass is simply infantry. In the ideal situation our defensive massing will not be concentrated enough for *the enemy* to expend a nuclear round, but will be enough to force the enemy to a degree of concentrated massing that will warrant *our* expenditure of a nuclear round.

### Conclusion

No weapon fire can compare in *accuracy* with infantry fire. No greater effect per pound of conventional firepower can be accomplished by any other means than that achieved by infantry weapons in the hands of flexible, determined infantry. In order to bring to bear a high volume of direct fire, you'll have to mass enough of your own infantry to deliver that volume of fire although the massing required always will be several degrees less for the defender than for the attacker. Each direct fire round performs the same function as a platform guard, shoving and compressing more and more people into a target subway train. But then you have it; if you mass your dug-in infantry so as to bring large volumes of direct fire to bear in the accurate fashion that only infantry can achieve, there's no way for the other side to avoid massing.

And while our defending troops are more dispersed and protected than his, a nuclear target has been created by infantry, the indispensable battlefield element, today or tomorrow.

# "FOLLOW ME"

## United States Army Infantry School

*"Close with the enemy, destroy or capture him, and occupy the ground." This is the mission of the American infantryman who goes forward day and night, regardless of weather and terrain, until it is completed.*

*He is the vanguard of freedom as he advances. Although the might of the Nation and all the Armed Forces are behind him, there is no one in front but the enemy. The foxholes of the infantry mark the battleline.*



Material for this article was furnished by Headquarters United States Army Infantry Center, Fort Benning, Georgia.—Editor.

ON 7 October 1918, when Camp Benning was founded as a consolidation of three infantry schools then operating at widely scattered locations, probably not

even the most farsighted military leaders could envision today's Fort Benning—an installation which has earned the title of "the world's most complete Army post."

From an original small tent encampment, Fort Benning has grown until today the post encompasses approximately 182,000 acres or 284 square miles.



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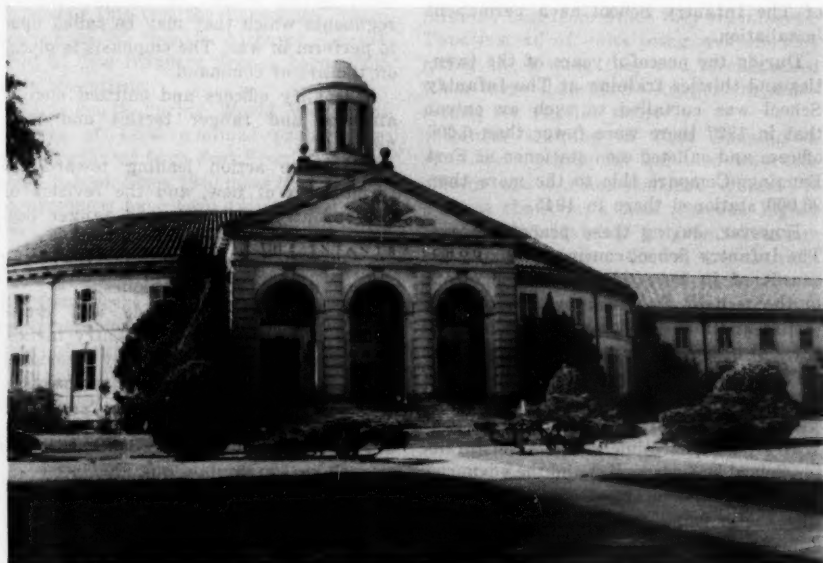
### History

The first U. S. Infantry School dates back to 1826 when the Infantry School of Practice opened at Jefferson Barracks, Missouri. This school was discontinued two years later when the Indian War interrupted its scheduled courses.

Almost 80 years passed until, in 1907,

established at Camp Perry, Ohio, and a Machinegun School at Camp Hancock, Georgia. The Infantry School of Arms continued to function at Fort Sill. These three schools were combined in 1918 to form The Infantry School at Fort Benning.

Following World War I the Department of the Army issued orders that Fort



**Headquarters United States Army Infantry School, Fort Benning, Georgia**

Lieutenant General Arthur MacArthur established a School of Musketry at the Presidio of Monterey, California. The school was moved in 1913 to Fort Sill, Oklahoma,

Benning was to be salvaged. Perhaps, except for the work of the commanding officer of the post at that time, that would have ended Fort Benning's history. But

*In keeping with its tradition, the United States Army Infantry School continues to fulfill its mission of training leaders in order that the infantry may carry out its decisive role in modern warfare*

and its name changed to The Infantry School of Arms.

During World War I Army expansion, a Small Arms Firing School was es-

Major Paul Jones, who received this order, consulted the dictionary and found that the word "salvage" meant "to save." Armed with this definition, he issued or-

ders that all buildings be painted to "save" them.

After a meeting of members of the Army's General Staff, it was decided to set up a peacetime infantry school at Fort Benning.

In September 1919 the order was issued for the complete and final organization of The Infantry School as a permanent installation.

During the peaceful years of the twenties and thirties training at The Infantry School was curtailed to such an extent that in 1927 there were fewer than 6,000 officers and enlisted men stationed at Fort Benning. Compare this to the more than 90,000 stationed there in 1945.

However, during these peaceful years, The Infantry School continued to give the benefit of its research and developments to the men of the infantry, not only in tactics and maneuvers to be used in combat, but also in allied subjects.

### World War II

With the United States entry into World War II, the peacetime role of The Infantry School was suspended and the advanced training of infantry officers, which had been the primary mission of the school for a quarter of a century, although not abandoned entirely, was temporarily curtailed. The basic training of infantry officers and officer candidates became the new mission of The Infantry School. In addition, the Parachute School was organized at Fort Benning at this time.

In July 1941 The Infantry School opened its first officer candidate class. The last World War II class was graduated on 9 December 1946. During that period The Infantry School graduated 66,141 second lieutenants of infantry.

Shortly after the termination of World War II the officer candidate program at Fort Benning was discontinued. With the outbreak of hostilities in Korea, however, the need for additional junior officers re-

sulted in a resumption of this program in February 1951.

### Mission

The mission of The Infantry School is to:

1. Prepare infantry officers and selected infantry enlisted personnel to perform those duties within reinforced infantry regiments which they may be called upon to perform in war. The emphasis is placed on the art of command.

2. Qualify officers and enlisted men in airborne and ranger tactics and techniques.

3. Initiate action leading toward the formulation of new, and the revision of old, infantry, airborne, and ranger doctrine and techniques.

4. Prepare infantry, airborne, and ranger doctrine and techniques.

5. Accomplish Army-wide and cross-service understanding of infantry tactics, techniques, and operations by providing training in limited numbers for members of other branches of the Army and other components of the Armed Forces.

6. Provide an Infantry Reserve Officers' Training Corps advisor and render assistance to the Reserve Officers' Training Corps program of the Army.

7. Provide support for such other training activities of the Army as may be directed by the United States Continental Army Command.

### Paratroopers

Fort Benning and paratroopers have become synonymous, and rightly so since the birth of the US airborne training occurred at The Infantry School in the summer of 1940.

The concept of parachuting troops into combat had its beginning shortly after the Army began to use aircraft. Two World War I advocates of airborne forces were Sir Winston Churchill and the late Brigadier General Billy Mitchell. In 1928 General Mitchell arranged the first airborne

demonstration at Kelly Field, Texas. Russia and Germany began airborne training in the early 1930's. However, it was not until World War II that the US Army adopted such training.

On 25 April 1940 a test platoon was organized at Fort Benning and made a successful jump at Lawson Field in August. Following this test the Parachute School, forerunner of today's Airborne Department of The Infantry School, began full-scale operations.

Each month during World War II an average of 4,000 qualified paratroopers were graduated from Fort Benning's Parachute School. Since 1940 more than 188,000 paratroopers have been trained and more than one million student jumps made.

Today, the airborne course consists of three weeks of training for enlisted men and four weeks for officers and top grade noncommissioned officers. During the final week of training, five actual jumps are required before the trainee qualifies as a paratrooper.

Throughout their history, airborne units have been distinguished by their combat aggressiveness and high standards of military bearing. These outstanding qualities are in keeping with the Airborne Department's high standards of military training, physical conditioning, military discipline, and appearance which distinguish the airborne soldier.

### Rangers

Rangers are the Army's military heirs to America's most rugged soldiers—Rogers, Mosby, Marion, and all the other leaders whose men fought by stealth and courage.

During World War II, Rangers were the first American ground troops to fight against Germany by participating in the Dieppe Raid. Ranger units spearheaded invasions of Africa, Sicily, Salerno, and Anzio. Of the 1,500 Rangers in action at Cisterna di Latina, only 200 survived.

With the outbreak of hostilities in Ko-

rea, Rangers again were called into battle. A Ranger Training Command was organized at Fort Benning to turn out completely trained Ranger companies.

However, combat experience indicated that there was a better use for the Rangers than in special Ranger companies. Graduates are now sent back to the regular infantry unit from which they volunteered. Thus instead of units being weakened by losing these men, they are strengthened when these same men—Ranger trained—return for regular duty.

Ranger training at Fort Benning—a seven-week course for qualified volunteer officers and noncommissioned officers—is perhaps the Army's most rigorous, highly concentrated training program. Students must embody brain, brawn, and courage to complete the course which is taught in three training areas: Fort Benning's rolling hills, northwest Florida's swamplands, and North Georgia's mountains.

The primary purpose of the Ranger Department is to produce tough, realistically trained leaders of small units, especially for patrol and raid-type missions. To do this the department has devised an exacting program which stresses the art of living, working, and fighting in small teams. Training emphasis is placed on mental alertness, physical conditioning, and survival know-how.

### The Allied Training Program

*There are peoples all over the world who are firmly on our side with their minds and hearts. They will gladly be on our side with their muscles as well, provided we go to the trouble of getting them started with their training and equipment.*

This statement by General James A. Van Fleet, former U. S. Eighth Army commander in Korea, could well serve as the philosophy behind one of The Infantry School's most important and far-reaching activities—training officers and a few highly qualified enlisted men from the armies of our allies.

The Allied Liaison Section, Office of the Director of Instruction, is the over-all coordinator of the allied students and assists in helping them become oriented quickly. This assistance includes furnishing interpreters for examinations, arranging for additional instruction, and handling personal problems and other administrative activities.

Begun more than two decades ago on a "good neighbor" basis with certain Latin American countries, the Allied Training Program at Fort Benning now trains about 800 officers from 30 different nations each year.

Future America will owe a debt of

gratitude to yesterday's and today's officers and men of The Infantry School whose vision and persistent effort created this center of instruction where the lessons of war are illustrated in comprehensive exercises according to the fundamentally correct doctrines of combat.

Today, the U. S. Army Infantry School continues to set the pace, fulfilling its mission of training leaders in order that the infantry may continue to carry out its decisive role in modern warfare.

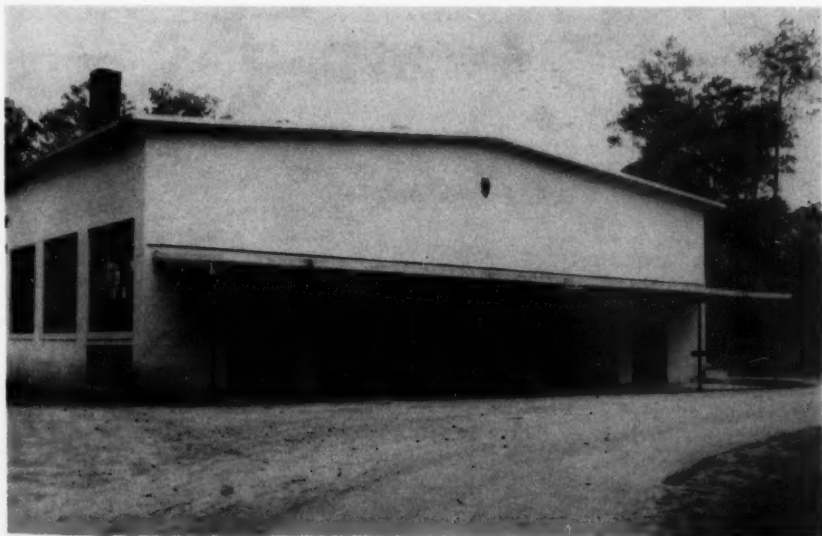
The following official United States Army photographs indicate the scope of activities conducted at the school.



"Follow Me"



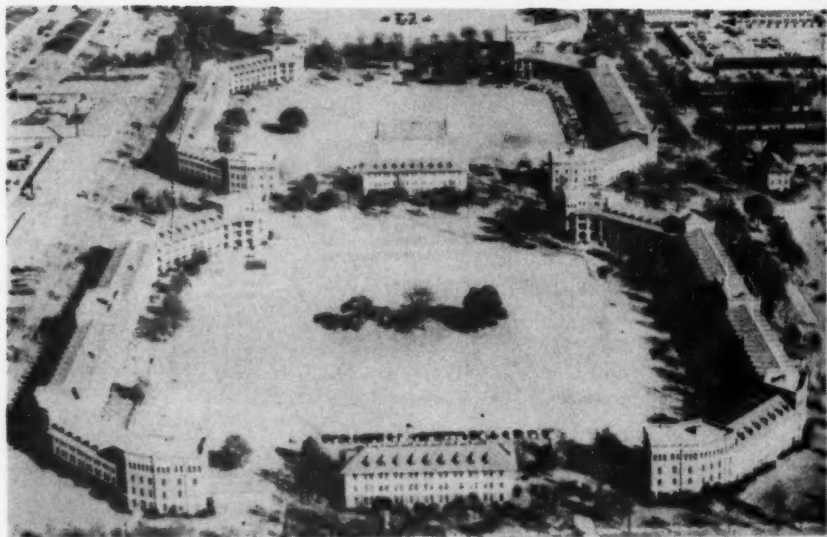
U. S. Army Infantry School's Brown Hall



Eiler Hall is used by the school's Field Engineering Committee



Post Chapel and Doughboy Stadium



Troop Housing at Fort Benning





An Associate Advanced officers' class in session in Pratt Hall at Fort Benning



A class of infantry officer candidates receiving instructions



Students of an officers' leader class at USAIF being briefed on a tactical problem

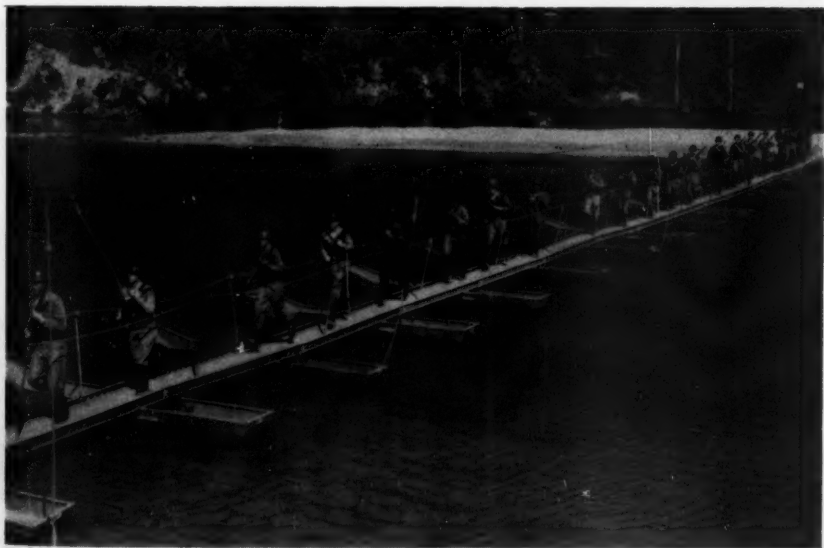


An infantryman using a flamethrower on a tank hull during a training exercise

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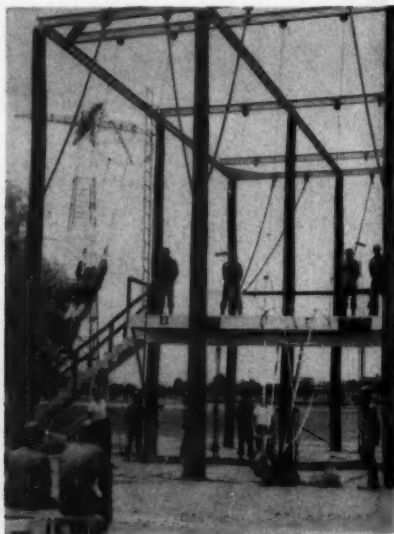


Above left, students at the U. S. Army Infantry School training on the 4.2 mortar. Above right, 81-mm mortar training also is received by students at Fort Benning. Below, troops crossing an aluminum floating footbridge during training exercises.



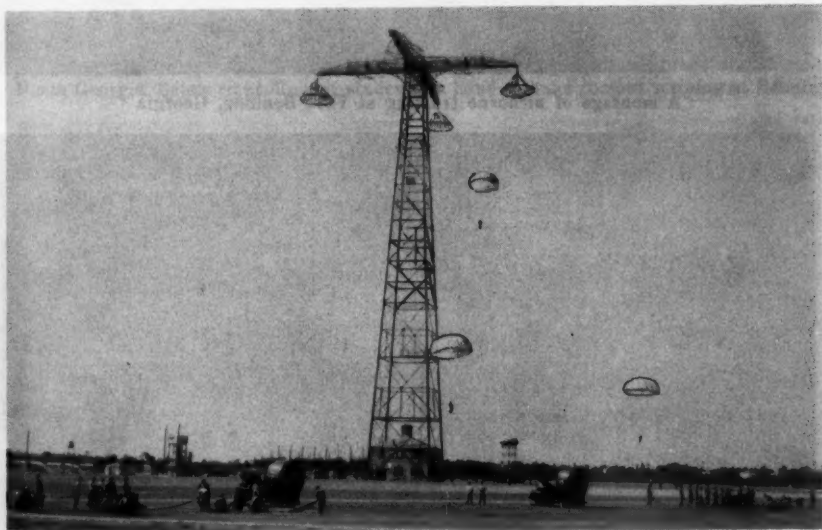


Above, infantrymen in a rubber boat crossing one of the many streams used in training at Fort Benning. Below left, 34-foot mock training tower used in basic airborne training. Below right, Basic Airborne Course student practicing on swing landing trainer.

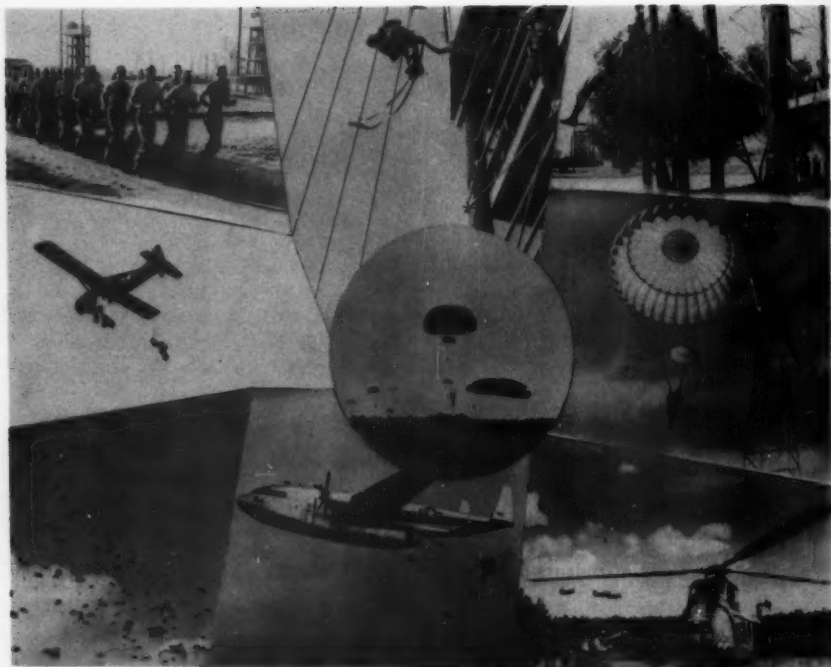




Basic Airborne Course students practicing parachute landing with aid of a wind machine



Basic Airborne Course students training on the 250-foot tower



A montage of airborne training at Fort Benning, Georgia

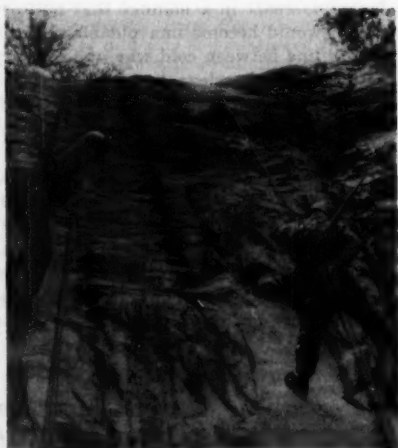


Ranger students crossing a stream on patrol





Above, Ranger students learning to cross streams with ropes at the jungle and amphibious camp operated by the U. S. Army Infantry School in Florida. Below left, *rappelling* is one of the techniques of mountain climbing taught at the Ranger mountain camp in North Georgia. Below right, Ranger students in hand-to-hand combat training at Benning.



# A United States Counteraggression Force

Lieutenant Colonel H. P. Rand, Artillery  
Faculty, U. S. Army Command and General Staff College



**W**AR need not be a conflict of arms! The conditions prevailing since World War II, exclusive of the periods of armed conflict, generally have been called cold war and had all the earmarks of a war, except for actual fighting. The period was characterized by a struggle between the Communist bloc led by the USSR, and the West led by the United States. The object of the struggle was to gain the support of the people and the governments of those nations belonging to the opposite camp, or of those nations remaining uncommitted. Political, economic, and psychological methods were used in the cold war to gain an advantage.

The possibility exists prominently that

Communist nonmilitary aggression may become so threatening to the security of the free world that the latter may be forced to react in a manner that military action would become unavoidable. The dividing line between cold war and military action is fairly clear but easily tripped over. The degree of determination to resist decrees whether cold war will lead to hot war.

The hot variety of war can be considered in different categories, from limited to general. Types of weapons used (conventional and different types and yields of nuclear weapons), geographical restraints observed, types and numbers of forces employed, and objectives sought—all these

*To carry out the strategic concept of preventing limited war, or successfully waging such war wherever it may occur, the US must develop a triservice force highly trained and capable of immediate commitment*

criteria are applicable to a categorizing of wars. When no restrictions are observed, total war exists. When restrictions are observed, whether by public declaration or through tacit consent between the parties involved, limited war exists.

### Limited War

For purposes of this discussion, limited war will be considered one in which the objectives sought by either side are limited. If it becomes apparent to one side that its objective cannot be attained, it may be either prepared to accept defeat or relax the self-imposed limitations on its objectives. To be limited the conflict must be aimed clearly at an objective other than the existence of the enemy state or its form of government. The temptation may arise for the victor to exploit military success in a limited war, materially change the objective, and eventually threaten the very existence of the loser. In the nuclear age such a temptation is most dangerous because the West's major antagonist of this era will, under any circumstances, maintain his massive retaliatory capability in reserve. This he is likely to employ only when survival of his government and na-

tion is at stake or to initiate a surprise general war.

Selectivity in the application of force is the most prominent characteristic of limited war. Land forces possess the best facility for graduating, to the degree required, the amount of force applied. The type and size of the forces employed—from infantry patrols to corps of armored divisions—the type and yields of weapons used—from rifles to missiles with nuclear warheads—the tactics applied—from harassing raids to deep penetrations—and the volume of support from other services—all of these afford the land forces a long and finely graduated scale of force application for limited war.

The brief history of the nuclear age supports the thesis that limited wars are more likely to occur than general war. The cold war which began after World War II has been interrupted by several instances of Communist aggression with limited objectives. Such aggression occurred even during the period when the United States alone possessed a capability to deliver nuclear weapons at great ranges. Although the Soviets refrained from direct and open involvement in the conflicts, their behind the scenes participation was apparent. Since there is no end in sight to Soviet expansionist desires and, therefore, to the cold war, the threat of limited war will remain an instrument of Soviet policy.

### Soviet Nuclear Diplomacy

The nuclear diplomacy of the Soviets might be taken as an indication that they are prepared to initiate global war. However, as long as they retain the initiative in the international power game through their political philosophy, they can afford to resort to nuclear diplomacy, knowing full well that the free world will not react to words with arms. There is little doubt that the dread of nuclear devastation exists worldwide. Soviet leaders themselves are subject to this fear from among their own people. No conceivable advantage can

*Lieutenant Colonel H. P. Rand received his A. B. degree from Columbia University in 1941 and was commissioned the following year. He was graduated from the Regular Course of the U. S. Army Command and General Staff College in 1953, and from the U. S. Army War College in 1958. During World War II he served with the 13th Armored Division in France and Germany, and from 1946 to 1949 he was with the 1st Constabulary Brigade in Germany. In 1953 he went to Korea where he was battalion commander and staff officer with the 7th Infantry Division and battalion commander with I Corps Artillery. Other assignments include duty with the Career Management Division, Department of the Army; Army War Plans Division, Office of the Director of Plans, Deputy Chief of Staff for Military Operations, Department of the Army; and three tours as instructor at the U. S. Army Artillery and Missile School. He now is assigned to the faculty of the USA CGSC.*

accrue to them if they initiate general war which would destroy much of the United States and, in retaliation, much of the USSR.

For the foreseeable future, however, because of communism's aggressive aims the free world is faced with the possibility of limited war. The United States, therefore, must develop a strategic concept which will help to prevent limited wars whenever possible and to deal with them decisively when they occur.

All Communist military aggression during the cold war years has been primarily by land forces, such as in Greece, Indochina, and Korea. The principal reaction of the free world in all these instances was the employment of countering land forces supported by naval and air forces as required. Land forces will, under all foreseeable conditions, continue to be the prime instrument of attaining Communist limited war objectives, and countering land forces will, therefore, remain the prime means of response by the West. In limited war the relative importance of land forces is materially greater from the outset than in general war where air forces predominate in the early stages.

The majority of the likely areas of Communist aggression lie at the fringes of the Iron Curtain in the Middle and Far East. In these areas the Communists can employ readily the numerically superior standing land forces at their disposal. In order to be assured of successful operations against such forces, the free world must maintain a capability for meeting such aggression promptly with land forces supported appropriately by air and naval elements as required by the situation. Not only must there be a sliding scale of deployable forces, but their fire support, the depth of their reinforcements, and the extent of their tactical and strategic air support also must be readily adjustable.

The initiation of nuclear warfare by the free world should be undertaken only for

defensive purposes. Many considerations govern the use of nuclear weapons. One of lesser import is that the Communists may be expected to make propaganda capital of the initiation of nuclear warfare by the West. However, the employment of nuclear weapons in a defensive role would largely vitiate Communist exploitation of a propaganda theme.

### Ground Force Deterrence

The effectiveness of land forces in deterring aggression lies in the clear understanding by the antagonist that the forces exist, that they will be employed, and that their employment would enjoy full popular support. In order for a deterrent force to be effective it must, according to Henry A. Kissinger in his *Nuclear Weapons and Foreign Policy*, "pose risks which will seem . . . out of proportion to any gains." Even if by the sheer weight of mass land forces the Communists could gain a limited objective in a limited war, the losses inflicted upon them in men, matériel, and in prestige must be so severe that they clearly outweigh the gains of the objectives attained.

A significant aspect of having forces immediately available is that the presence of United States troops so far has consistently deterred Communist overt aggression. The Communists have attacked only in places where no United States troops were stationed or where the United States had indicated or implied she would not intervene. With the fear of general war, linked with limited war in the minds of the statesmen of the world, the actual presence of United States troops or their immediate availability is a strong deterrent to Soviet attack. Satellite countries also will act with significantly more restraint when US forces are on the ground or can be expected to intervene in a minimum of time.

It is difficult to establish the precise size of land forces needed as a successful deterrent to limited war. A valid available

measure is the Korean war experience when the United States employed up to eight Army divisions and one Marine division alongside 21 allied divisions. The initial United States commitment was limited to elements of one division. The buildup of United States forces was so slow that almost the entire Korean Peninsula was overrun by the enemy. The immediately available forces were of critical significance. The size of such forces should be sufficient that together with the forces of the nation under attack they can contain that attack until additional forces can be deployed to win the war.

### Organization

In order to attain a strong deterrent stature needed to defeat any limited Communist aggression, the United States must develop a force for that specific purpose. The designation of the Strategic Army Corps (STRAC), from which the slogan "Skilled, Tough, Ready Around the Clock" is derived, is a positive step toward this goal. However, it is believed that this force would be better able to discharge the vital functions envisaged for it if it were triservice in design. The force eventually should consist of six Army divisions organized into two corps so that provision would be made for a two-pronged aggression—a likely and logical Communist tactic. Navy and Air Force forces must be a part of the force to give it the necessary support, both for lift to the area of conflict as well as for combat support in the area.

This triservice force should be established prior to making a public announcement to the effect that the US Counteraggression Force (USCAF) has been created.

To attain maximum effectiveness, the elements of all three services making up USCAF should be either permanently assigned, or at least earmarked for limited war. In this way the US would possess a limited war force comparable to the Stra-

tegic Air Command. Joint planning, joint training, and joint maneuvers would be conducted and close coordination in tactical and logistical matters would result.

A joint command structure is needed which would allow the Joint Chiefs of Staff to designate USCAF as a JCS joint task force. Since the Army's land forces would be the primary ingredient of the USCAF, the Army should be designated as executive agent.

The USCAF elements should receive such special training, equipment, and attachments as the world situation dictates from time to time. In addition to being a military weapon, the USCAF thus could become a potent policy instrument for the handling of US foreign affairs. If, for example, the Middle East begins to look like the most likely area for Communist subversion and military activity, the US Government can announce publicly that USCAF has been directed to equip and train for operation in hot desert country.

The land forces must possess a full range of fire support capabilities. Conventional artillery must exist side by side with weapons capable of delivering fractional to large-yield nuclear weapons. The knowledge that US land forces are equipped to deliver such fires will add significantly to USCAF's deterrent effect. Air Force and Navy aerial support elements must habitually be with USCAF to provide strategic and deep tactical fire support to the land forces, if needed.

### Airlift Essential

Much of the effectiveness of the USCAF depends on its prompt availability in any theater of operations. In the event of local aggression and in order to enable the Army to place strong initial forces on the ground, airlift should be available to USCAF. This airlift should be sufficient to lift combat elements of two divisions plus the necessary support units. Sealift to carry the balance of the two division forces must be on hand promptly. The required lift for

resupply, and the transportation of additional division forces, as required, must be readily available for assembly within 10 to 15 days after the initial elements have been dispatched.

Prompt employment of USCAF would be greatly expedited by prestockage of certain supplies and equipment in selected areas of the world. Such prestockage would be further evidence of US determination to resist aggression.

Elements of USCAF which would be deployed first must be in a high state of readiness. Not only is this a challenge to training, but difficult personnel problems also must be solved. The units must be up to required strength levels at all times, with all personnel qualified and eligible for overseas shipment. This is particularly difficult when shrinking personnel ceilings require tactical units to perform many extraneous, administrative missions. Maintaining a high level of readiness also affects the morale of a unit. The personnel must be so indoctrinated that the need for the intense and repeated unilateral and joint training exercises is ever apparent. The troops must appreciate that they contribute significantly to the security of the United States. Education and information services must keep the units abreast of world developments and alert to the ever-shifting directions and levels of Communist aggression, military or otherwise.

It is conceivable that USCAF forces would be deployed in full, or that elements would be employed in several places simultaneously. Whenever the primary deterrent land forces and supporting Navy and Air Force elements are thus committed, Reserve component elements of all three services must be so organized as to be capable of reconstituting an appropriate reserve. Plans must be developed for the mobilization of balanced triservice forces whose composition closely resembles that of USCAF. These units should enjoy a high priority within the Reserve establish-

ment in terms of personnel, equipment, and training. Eventually, designated Reserve component elements should plan and train together, similar to the active element of USCAF.

### Obstacles

Many obstacles exist to the establishment of a US force of the type proposed. With present Army force levels it is not possible to form a six division force and maintain existing overseas commitments. An Army manpower level of at least one million men must be attained to establish USCAF, maintain overseas forces, and continue all other existing commitments.

A national educational program must be undertaken to convince the people of the United States that a force such as USCAF is an essential tool for the free world. In addition to influencing domestic public opinion the United States must win world opinion over to the idea of USCAF. Soviet propaganda would undoubtedly promptly affix the aggressor label to the force. The United States can prevent this by dramatizing USCAF as a tool to stop further Communist expansion. The best medium for ready access to all nations of the world is the United Nations. The United States has been using the UN frequently and habitually for her conduct of international relations.

### United Nations Peace Force

Provisions contained both in the charter of the United Nations and in the UN's "Uniting for Peace Resolution" of 1951 call for force contributions by member nations to maintain international peace and security. Strenuous and prolonged efforts of various bodies of the UN to create such forces have failed primarily as a result of the East-West cleavage which seems to have prevented agreement on any of the major issues since World War II.

It is proposed that the United States offer the USCAF to the United Nations for the purpose of assisting in fighting



aggression wherever it may occur. The language of the US offer must be prepared carefully so that it will not commit the US to send forces under circumstances which are contrary to her best interests. As a further safeguard in this respect, there is a clause in the "Uniting for Peace Resolution" which provides that national interests override those of the UN.

The US must make it clear that all potential victims of aggression should be prepared to defend themselves, and that only when their own forces are unable to stop and defeat the Communist aggression will USCAF be called upon.

Despite the opposition of the USSR bloc, which is bound to arise, the propaganda value of such a United States offer is estimated to be so great, particularly among the neutral nations of the world, that the United States—and along with her the entire free world—would gain immeasurably in prestige and esteem worldwide. Quite conceivably, the US offer may be accepted in the General Assembly where

the USSR has no opportunity to exercise the veto. UN acceptance of USCAF would provide a powerful tool to the United Nations for maintenance of peace.

### Conclusion

The cost to the US Government of shifting emphasis toward forces prepared for the most likely form of war—limited war—would be significant. However, along with the decision to initiate such a program a reevaluation of the entire defense program should be made—a reevaluation designed to ascertain whether there are possible areas where excessive emphasis is being placed on preparation for general war, which is assessed to be the least likely to occur.

If the threat of the massed Communist land forces is clearly presented to the people of the United States, they will see the need for and support strong preparations for that type of war which the Communists most likely will use in their efforts to bring on the early downfall of the Western World.

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It is of vital importance to the Nation as a whole that the capability be maintained for both general and limited war to be deterred if possible and to be successfully dealt with if deterrence fails. This capability depends upon the combined capabilities of all the Armed Forces. As President Eisenhower has said, 'Separate ground, sea, and air warfare is gone forever.' It follows that to the extent that the capability of any one of the Armed Forces might be deficient, total capability would be reduced.

*General Lyman L. Lemnitzer*

# Coordination of Fire and Maneuver On the Nuclear Battlefield

Major Robert M. Young, *Artillery*

Faculty, U. S. Army Command and General Staff College

**I**N PRENUCLEAR days the coordination of fire support with maneuver was a relatively simple task when compared with the problems that will face the commander on the nuclear battlefield. The coordination problem is more complex, for the commander must consider the multitudinous effects available from supporting weapons and coordinate these effects under the influence of rapidly changing conditions. The commander must be provided with measures that will enable him to coordinate supporting fires with maneuver, effectively, instantaneously, and with safety to his command.

Tactical operations on the nuclear battlefield will be fluid and conducted from dispersed positions. Ground combat will continue to consist of fire and maneuver with maximum flexibility the keynote. Offensive operations will be similar to reconnaissance in force—the attacker, utilizing small mobile task forces (air or ground), will seek the enemy forces, compress them into a target, and destroy them by nuclear fires. The advance will be made in air and ground mobile, multiple, dispersed columns with the momentum maintained by fire and maneuver. Defensive operations will be characterized by the same fluidity and oriented upon destroying the enemy by offensive action. To achieve the required flexibility and mobility the basic combat units

will be small mobile forces, with infantry, artillery, signal, armor, engineers as required, and essential service support. These mobile forces will be semi-independent and must be capable of operating over extended distances with minimum control and support by higher headquarters.

These concepts and principles have been accepted and are being used as the basis of tactical instruction in the service schools and the U. S. Army Command and General Staff College. Despite this acceptance, however, these concepts are not completely compatible with the existing coordination measures.

## Too Much Control

*A multiplicity of antiquated fire coordination measures are restricting the initiative of the commanders and limiting the maneuver of their commands.*

Since World War II there has been a progressive increase in the number of control measures used in the coordination of fires and maneuver. The increased range of effects introduced by the nuclear weapons has been recognized by the introduction of new control measures. The atomic bomb line, the atomic no-fire line, and the atomic safety line have been introduced as required through the media of service schools, command post exercises, and field maneuvers. These new measures and their definitions are now appearing in doctrinal

*Adoption of the fire coordination area, bounded by a near limit and a far limit, will result in more freedom of maneuver and still accomplish the degree of control necessary for nuclear battlefield operations*

publications, with different definitions in different publications. They have not as yet been incorporated into either the *Dictionary of United States Army Military Terms* or the *Dictionary of United States Military Terms for Joint Usage*. This results in personnel using terms which are not universally accepted with a common definition.

In addition to the terms created to control nuclear weapons and their effects, all other existing control measures have been retained. As a result there now are eight separate and distinct lines used to coordinate fire support with maneuver:

1. Boundary.
2. No-fire line.
3. Bomb line.
4. Atomic safety line.
5. Atomic no-fire line.
6. Atomic bomb line.
7. Fire coordination line.
8. Limit of advance.

With these numerous linear coordination measures, commanders are faced with the impossible task of coordinating fire support with maneuver on a fluid, dispersed battlefield where only the combatant with the most rapid reaction time will survive.

To overcome the restrictions imposed by these linear coordination measures and to ensure that the maneuver commanders on

the nuclear battlefield are permitted to exploit the principal of initiative, the present measures of coordination must be adjusted.

There are two possible courses of action to solve this problem. First, retention of the present linear concept by eliminating certain terms and redefining the remainder to incorporate the effects that were controlled by the eliminated terms. Second, *adoption of an entirely new concept by utilizing an area as the means to coordinate fires with maneuver.*

#### Current Control Measures

Before comparing the relative advantages and disadvantages of these two courses of action, the existing control measures should be reviewed.

1. *Boundaries* as presently used delineate area responsibilities. Their influence on fire coordination is inherent in this assigned responsibility. Commanders assigned an area outlined by boundaries are responsible for fire and maneuver in that area, recognizing that adjacent units will not fire or maneuver within the area without their approval and coordination. As dispersion on the battlefield increases and the conduct of military operations becomes more decentralized, boundaries may become less favored as a means of control. Within the current timeframe, however, and until other satisfactory means of assigning area responsibilities are developed, the boundary must continue to be a fire coordination measure.

2. The *no-fire line* was developed before the advent of nuclear weapons. It was designed to provide the regiment or combat command an area forward of its position in which control of all fire and maneuver could be exercised. The purpose was to provide safety to the troops in the area and protect them from effects of artillery fire delivered by higher or adjacent echelons. A means for prescribing an area of responsibility forward of the battle group or combat command is required. The present definitions of the no-fire line partially

*Major Robert M. Young was graduated from the University of Oklahoma in 1943; completed the Advanced Course of the U. S. Army Artillery and Missile School in 1952; and the Regular Course of the U. S. Army Command and General Staff College in 1956. He served in the China-Burma-India theater during World War II; was Post S2, Wetzel Military Post, 1947-48; with the G2 Section, 1st Infantry Division, 1948-49; and from 1950 to 1952 was with the 4th Field Artillery Battalion (Pack), the 40th Field Artillery Group, and the 756th Field Artillery Battalion. Prior to being assigned to Fort Leavenworth in 1955 as a student, he was S2, 42d Field Artillery Group, Seventh Army. A member of the faculty of the USA CGSC since 1956, Major Young currently is under orders for duty in Korea.*

accomplish this. However, they consider only the effects of conventional artillery fire and not the effects of nuclear weapons. The measure used to provide this area responsibility must now consider the effects of nuclear weapons as well as conventional artillery fire. This includes not only the immediate effects of blast, thermal, or radiation, but also the creation of obstacles by blowdown, fires, dust, or contamination.

3. The *atomic no-fire line* has been introduced and used in recognition of nuclear weapons and the greater range of their effects as an attempt to overcome the shortcomings of the no-fire line. However, this line recognizes only the immediate effect on personnel and matériel and not the possible effect on maneuver by the creation of an obstacle between the maneuver commander and his objective.

4. *Bomb lines* have been developed to provide the ground force commander an area forward of his position in which he could maneuver freely without coordination with the Air Force and without fear of being attacked by friendly aircraft. They also provided freedom to the Air Force in conducting strikes forward of the lines without coordination with the ground forces. The *bomb line* considers the effect of only high-explosive type bombs and has continued in use despite the development of nuclear bombs. The *atomic bomb line* has been introduced and used in recognition of nuclear weapons and their tactical employment. It is an attempt to provide protection to ground forces from the effect of uncoordinated nuclear bomb strikes by the Air Force. It provides freedom of maneuver short of the line to the ground forces and freedom to the Air Force in conducting strikes beyond the line.

5. The *atomic safety line* was developed to provide, primarily, safety to friendly forces and has assumed, through usage, the control of fires. The definition con-

tained in Field Manual 7-100, "The Infantry Division," recognizes the use of the atomic safety line and the necessity for such a line in providing safety to friendly forces from the immediate effects of thermal, blast, and radiation. It properly does not consider the effect on maneuver. Employment of nuclear weapons on the battlefield requires the continued use of a comparable safety control measure. A properly designated and defined phase line could accomplish the same result without the requirement for a specialized term.

6. The *fire coordination line* was developed by necessity to delineate area responsibility for and between airborne forces and link-up forces. It also is applicable and of material assistance to the planning of fires for converging ground forces. The definitions given, and in use, do not imply control over or coordination of the employment of nuclear weapons. There is a continued requirement for a means of establishing area responsibility around and in front of the link-up force as well as in front of two converging ground force units.

7. The *limit of advance* as defined in Field Manual 7-100, "The Infantry Division," includes control of fires. The intent of providing for troop safety is valid. However, it does not recognize the possibility of effects across this line. In use, it prescribes the physical location of a position beyond which maneuvering troops should not pass. In order to satisfy the safety provision, another line is required beyond the "limit of advance" line to ensure that effects of weapons do not jeopardize the safety of troops physically occupying the "limit of advance" line. As was the case in the "atomic safety line" a properly designated and defined phase line could be used in lieu of the "limit of advance" and the requirement for another specialized term is obviated.

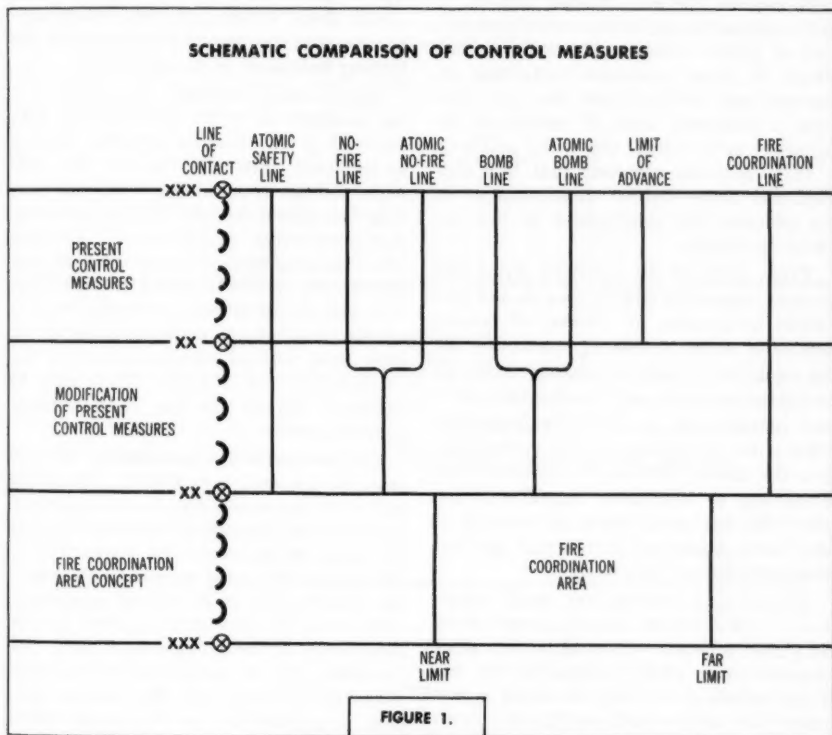
A schematic portrayal of the employment of these various control lines for a left flank division is indicated in Figure 1.

### Change Definitions

In an attempt to decrease the number of control measures presently in use and thereby avoid some of the restrictions imposed upon commanders of maneuvering units, some proponents are in favor of retaining the present concept by redefinition

"bomb line," and "fire coordination line" to include control of effects. As an example the new definition for the "no-fire line" might be:

*The no-fire line is a line beyond which artillery units may fire without prior clearance from the unit establishing the*



and elimination of some of the existing control measures.

Retention of the present concept will require the continued use of multiple lines to coordinate fires and maneuver. The advocates of this course of action believe this could best be accomplished by eliminating the "atomic no-fire line" and "atomic bomb line" and redefining the "no-fire line."

line, provided the effects of such fire do not extend short of the line.

The redefinition of the "bomb line" and "fire coordination line" would be similar in that effects would be precluded from transgressing the lines. This action would leave the following control measures in effect: boundary; no-fire line (redefined); bomb line (redefined); atomic safety line;

fire coordination line (redefined); and limit of advance. A schematic portrayal of this concept for an interior division is as shown in Figure 1.

Those who recommend retaining the concept set forth in this course of action give the following as their reasons: *first*, it will require minimal change; *second*, it will continue to emphasize centralized control at higher echelons of command; and *third*, it places minimum restriction on conventional artillery fires that are fired into a division's area of operations by adjacent units, corps, and army artillery.

It is believed, however, that this concept has three distinct disadvantages to its adoption for employment on the nuclear battlefield:

*First*, although the redefined terms will control immediate effects, they do not recognize or provide for control of lasting effects in a unit's area of operations. As an example, a nuclear weapon could be employed beyond a unit's no-fire line, without coordination, so that the immediate effects did not transgress the no-fire line, yet the lasting effects of contamination, cratering, or blowdown immediately beyond the line could prove an obstacle to the unit's maneuver and impair the accomplishment of its mission.

*Second*, and perhaps the most important, is the retention of centralized control at higher echelons of command. The basic premise upon which tactics for the nuclear battlefield are being developed is that operations will be conducted by small semi-independent mobile forces capable of operating over extended distances with minimum control and support by higher headquarters. To retain centralized control at the higher headquarters will restrict the application of the principal of initiative by the commanders of these semi-independent forces and be tantamount to their destruction.

*Third*, mutual understanding will be im-

paired in the redefining of an existing definition to increase its scope.

### "Fire Coordination Area"

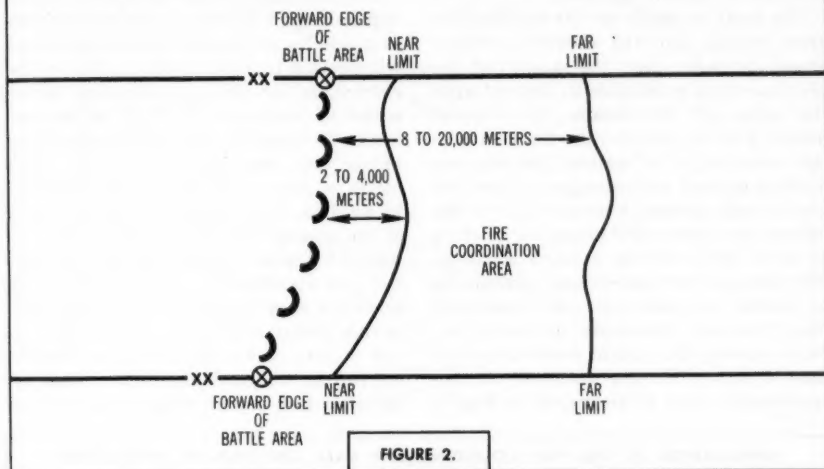
To overcome the disadvantages and the restrictions imposed by the present linear system and the proposed modification thereof, the adoption of the "Fire Coordination Area" which is an area system compatible with the tactics developed for the nuclear battlefield is recommended.

This proposed concept will provide for the creation of a fire coordination area forward of or around a division. Higher or adjacent units will not fire into this area without coordination with the division that established it. The fire coordination area would be defined as: "An area into which higher or adjacent echelons may deliver fire or effects only after coordination with the force that established it. Fire or effects will not be delivered short of the near limit without specific request of the establishing unit. Fire or effects may be delivered beyond the far limit without coordination."

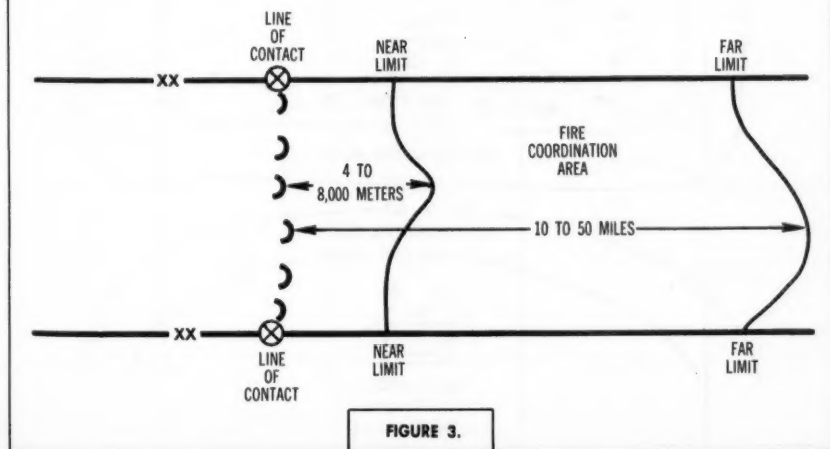
The procedure for establishing the fire coordination area is as follows. The battle group or combat command commander will establish the location of the near limit of the area in his sector and forward it to the division fire support coordination center (FSCC) where it will be coordinated with those of other division units and be established as the division near limit. The far limit will be established by the division FSCC, based upon the division mission, and submitted to the corps FSCC (tactical operations center (TOC)) where it will be coordinated with the other divisions across the corps front. (A schematic portrayal of this concept for a right flank division is shown in Figure 1.) After coordination of the far limits of the divisional fire coordination areas, the corps FSCC would transmit its location to corps artillery units, artillery of the divisions of the corps, adjacent corps, and to the



## APPLICATION OF THE FIRE COORDINATION AREA ON THE DEFENSE



## APPLICATION OF THE FIRE COORDINATION AREA ON THE OFFENSE



Army operations center or comparable agency. Where possible the trace of the near and far limits should follow easily identifiable terrain features.

The depth to which the fire coordination area extends into the enemy's territory should be based upon the mission of the division which establishes it, and not upon the range of the organic fire support means. For the defense, the fire coordination area might be shallow, thereby permitting greater centralization of the fire control and support at corps level. For the offense the depth could extend as much as 40 to 50 miles into the enemy's territory. This would permit the division commander to control all maneuver and supporting fires, with both immediate and lasting effects, between his present position and his final objective. The application of the fire coordination area is portrayed in Figure

2 for the defense and Figure 3 for the offense.

### Link-Up Operations

The fire coordination area also will be applicable in amphibious and airborne operations. Its use during link-up operations will provide for elimination of the fire coordination line. In its application during a link-up operation the force in the airhead will establish a fire coordination area around its position. The link-up force moves a fire coordination area ahead of its position. Upon merger of the far limits of the area of each force, the far limit at point of linkup is eliminated and the control and coordination of fires within the combined areas passes to the commander having prearranged responsibility for control of fires during actual linkup. Following linkup, the combined forces would establish a new fire coordination area based

## APPLICATION OF THE FIRE COORDINATION AREA ON LINK-UP OPERATIONS

### STEP 1. PRIOR TO LINKUP

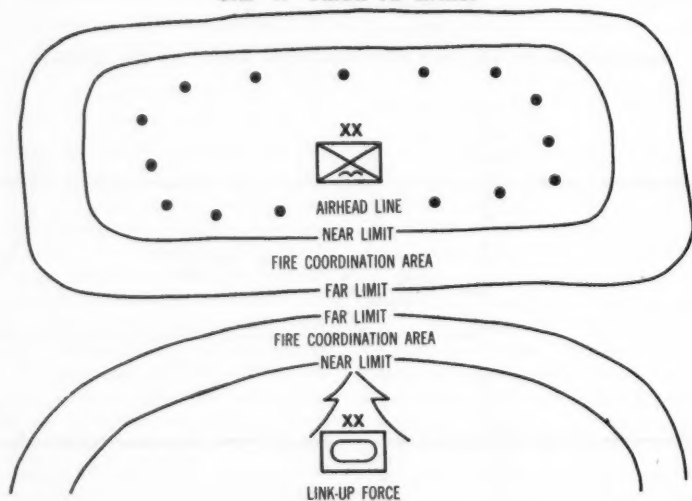
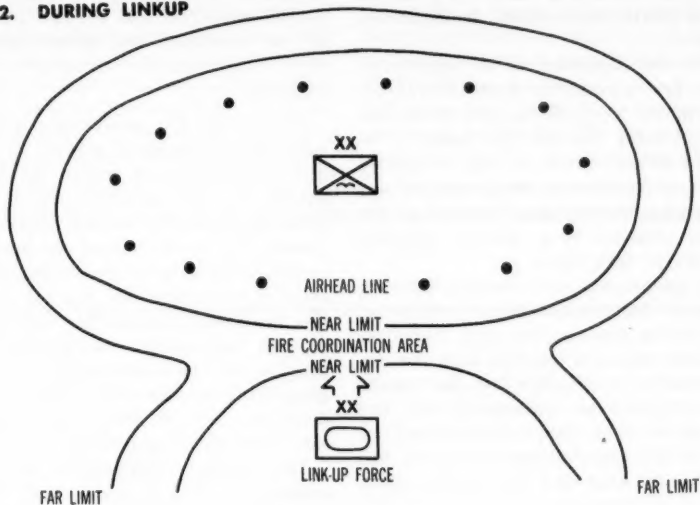
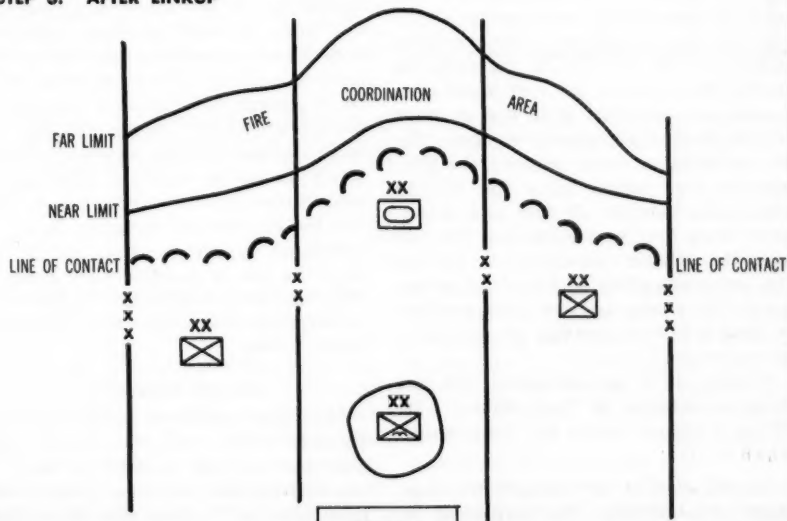


FIGURE 4.

**STEP 2. DURING LINKUP****FIGURE 5.****STEP 3. AFTER LINKUP****FIGURE 6.**

upon their mission. A schematic portrayal of this application is shown in Figures 4, 5, and 6.

While the discussion of the application of the fire coordination area concept has been limited to divisional size units, this does not infer that its application is restricted to such units. It may be applied with equal facility and effectiveness to any size independent mobile force such as the cavalry regiment or a specially designed independent task force.

The advantages and disadvantages of retaining the present linear concept of coordinating fire support with maneuver have been reviewed together with the recommendation of adopting the area concept of coordination as contained in the fire coordination area. Next to be discussed are some of the accomplishments of the fire coordination area and the factors upon which it is developed.

#### Important Factors

The fire coordination area concept recognizes the division as the maneuver element of corps in the same manner as the regiment was recognized as the maneuver element of the division. In the past, the no-fire line provided the regimental commander an area, short of the line, in which he coordinated all supporting fires. The fire coordination area provides the division an area within which the division commander controls all fires and coordinates these fires with maneuver. This allows the division commander to prevent the immediate effects of fires from endangering his troops and the lasting effects of those fires from creating an obstacle to his maneuver.

Further, it is in consonance with the doctrine contained in Field Manual 6-20, "Field Artillery Tactics and Techniques," which states:

*Coordination of fire support is a command responsibility. The supported or force commander is responsible for the co-*

*ordination of all available supporting fires—with each other and with the operations of his command—and makes basic decisions concerning the coordination of fire support.*

Use of the fire coordination area permits the commander to control all organic and supporting fires within the area required for the accomplishment of his mission. Use of the existing linear means permits him to control and coordinate conventional artillery fire only within the area short of his no-fire line. The fire coordination area also is compatible with the concept of surveillance coordination which provides for the establishment of area responsibility for divisions, corps, and the field army, by the use of "areas of influence" and "areas of interest."

This concept complements the organizational concepts of and permits full exploitation of the mobility of the new type divisions. The infantry division is capable of mechanizing two of its five battle groups with organic equipment and may be augmented by sufficient armored carriers from field army to permit complete mechanization. There are sufficient aircraft at field army to airlift the assault elements of five battle groups. This mobility provides the division commander with a high degree of responsiveness with his maneuver elements which should be exploited. This may be accomplished by permitting him to exercise the principal of initiative by coordinating all supporting fires, rather than requiring him to coordinate his maneuver with the fires delivered by adjacent or higher echelons as is done with the present linear concept.

#### Target Acquisition

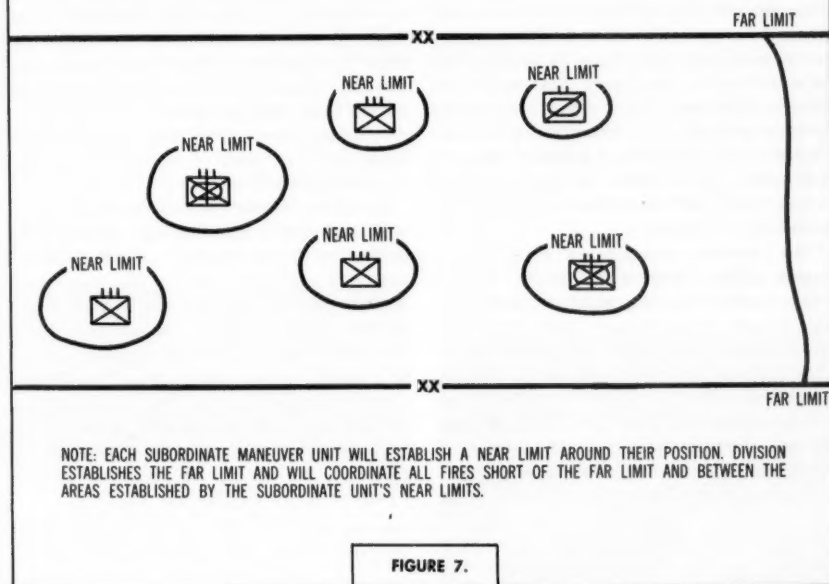
The target acquisition capabilities of the divisions which, with the present equipment and agencies available to them, are qualitatively equal to those of the present type corps, will concentrate their efforts within their respective fire coordination

areas. The corps will concentrate its target acquisition efforts beyond the far limit of the divisions' fire coordination areas. This is a continuation of the present observation line concept (O-O line) without requiring the use of an O-O line. In the event that an adjacent division or a corps acquisition means should detect a target within

any more time than the coordination effected by a direct support forward observer to obtain long-range fire on a target he has detected, but cannot reach with his unit's organic weapons.

The present Joint Agreement as contained in CONARC TT 110-101-1 automatically establishes a bomb line 100 miles

#### APPLICATION WHEN UNITS ARE OPERATING WITHOUT CONTIGUOUS FLANKS



a division fire coordination area, coordination would be effected with that division prior to firing on the target. The communication facilities of the artillery as augmented by the area communications system will permit this coordination in minimal time. The fire direction centers and the fire support coordination centers of the division and corps are connected by this communication system, so that the lateral or downward coordination should not require

forward of the line of contact. If it were desirable to bring the bomb line in closer or extend it out farther, this could be accomplished by furnishing the trace of the far limit of the fire coordination area to the Air Force. The far limit thereby becomes the bomb line without requiring a separate term to define it.

Dispersed elements, wide frontages, and decentralization of command on the nuclear battlefield will result in units op-

erating without contiguous flanks and will force decentralization of fire support. The current trend of increased division frontages to between 20,000 and 35,000 meters with resulting corps frontages of from 40 to 80 miles will require decentralization of corps artillery. This decentralization may be accomplished by attachment of corps artillery units to the divisions or by corps artillery assigning their units missions which will permit division artillery to control all or a portion of their fires. This decentralization appears more logical when the range of division artillery weapons is compared with those of corps artillery and it is discovered that only the 155-mm gun and the *Corporal* outrange division artillery. An example of the application of the fire coordination area to a division area in which the battle groups are operating without contiguous flanks is contained in Figure 7.

The nuclear weapon is a principal means of fire support and units with organic nuclear delivery weapons should be able to use those weapons with minimum restrictions. Under the fire coordination area concept, the division could employ nuclear weapons within its "area" without coordination, providing the effects of that weapon did not transgress the limits of its "area." The same is applicable at corps and army level. These two echelons could

employ nuclear weapons beyond the far limit of division fire coordination areas without coordinating with the divisions. The employment of nuclear weapons in both cases, of course, would be subsequent to the notification of the Air Force as required by Joint Agreement.

### Conclusion

Introduction of the fire coordination area with its near and far limits and the unit boundaries as the measure to be used in coordination of fire and maneuver provides for the elimination of the following lines: no-fire line; bomb line; atomic no-fire line; atomic bomb line; the fire coordination line; and proposes the substitution of properly designated and defined phase lines for the "limit of advance" and the "atomic safety line."

Adoption of the fire coordination area will introduce a new concept that is compatible with the fluidity of the nuclear battlefield. It will permit the maneuver commanders to exercise the initiative required by the nuclear tactics that have been developed and are being presented by the service schools and the U. S. Army Command and General Staff College. The concept is simple and flexible and may be used to control high-explosive, nuclear, chemical, biological, and possible future weapons effects with equal facility.

## MOVING?

If you are moving, please notify the MILITARY REVIEW, Fort Leavenworth, Kansas, of your change of address. Be sure to include your name, *old* address, and *new* address.



# MILITARY NOTES

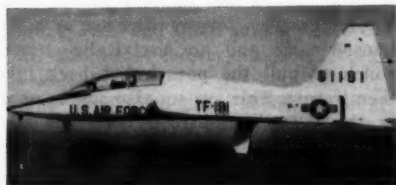
## AROUND THE WORLD

### UNITED STATES

#### **Aircraft Family**

It has been estimated that 82 percent of the parts of the *T-38 Talon* supersonic trainer and the *N-156F* multipurpose fighter aircraft are interchangeable.

The *T-38*, designed to train pilots for advanced aircraft operation, has made its first test flight. It weighs approximately



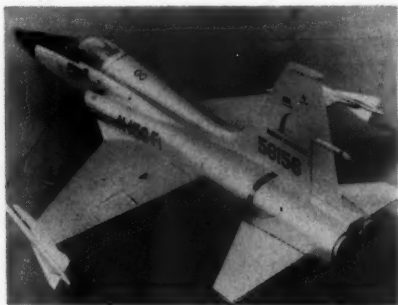
***Talon T-38* supersonic trainer**

10,960 pounds at takeoff, and has an operating range of more than 1,000 nautical miles.

The *N-156F*, which weighs 12,235 pounds at takeoff, is designed for ability to deliver both air-to-air and air-to-ground advanced weapons, and to have a short takeoff and landing capability unique in present-day supersonic fighters. It is an all-purpose aircraft to take the place of the present all-weather, day, and strike fighter categories. The *N-156F* has a speed of about Mach 1.5 and a range of more than 2,000 nautical miles. Normal growth of engine performance is expected to put the *N-156F*

in the Mach 2 class. This aircraft also has a zero length launch capability. Both the *N-156F* and the *T-38* are powered by two *J85* turbojet engines with afterburners, and are designed to the "coke bottle" configuration of the "area rule" theory.

A rocket-powered version of the *T-38* is said to be in the project design stage. This aircraft, to be known as the *N-205*,



**Mockup of the multipurpose *N-156F***

is said to have three 10,000-pound thrust liquid propellant rocket motors which will bring it to a peak speed of Mach 3.2 (about 2,100 miles an hour). A zero length launching system would be used with the *N-205*, which could coast on a ballistic trajectory to an altitude of 200,000 feet.—News item.

### Cylindrical Windshield

A windshield only one inch high is proposed for use in place of a periscope in tanks and as a windshield for supersonic planes. This system, which uses a cylindrical lens rather than the conventional spherical one, enables a plane pilot or tank driver to see a large area ahead that appears natural and normal in size. The application of the one-inch windshield to supersonic planes will permit better streamlining. In addition, it will overcome the problem created by the fact that high speeds develop such heat that present windshields cannot be made of ordinary glass.—News item.

### Over Snow Vehicle

The *Sno-Cat* is the standard over snow vehicle in use in most of the deep snow areas of North America. Although the heaviest models weigh as much as 8,000 pounds, they have a ground pressure of .66 pounds per square inch which is only slightly greater than that of a skier. The *Sno-Cat*, which has a top speed of 15 miles an hour, is in use by the United States



*Sno-Cat* is extremely mobile in deep snow

Army Snow Ice and Permafrost Research Establishment in Upper Michigan, California, and on the Greenland icecap.

Four of these vehicles were used by Dr. Fuchs in his 2,200-mile trek across Antarctica during the recently completed International Geophysical Year explorations of the South Pole area.—News item.

### 'C-130' Modification

A modification of the *C-130 Hercules* under consideration plans to mount two turbojet engines in pods under the wings of the big troop-cargo carrier aircraft. The two jet engines will be used to blow a constant stream of air over the wings and tail surfaces of the aircraft during takeoffs and landings and will be in addition to the four *T56* turboprop engines now used to power the airplane. Present *C-130's* fly 350 miles an hour at altitudes up to 35,000 feet, and can transport 92 troops or 20 tons of cargo.

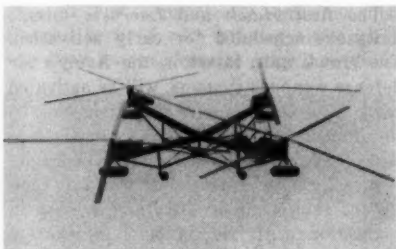
Despite its size and weight, the *Hercules* can take off after a run of about 850 feet. The addition of the boundary layer control feature is expected to reduce the landing and takeoff distance for assault operations at frontline airstrips where distance is minimum. Also perfected for the *C-130* is a device which permits the retrieving of parachutists who become entangled with trailing lines when jumping in airborne operations. This involves the use of a retriever cable and an electrically driven winch to pull the parachutist back into the aircraft. This system also can be used in the *C-123* cargo-troop transport aircraft.—News item.

### Project 'Subic'

Project *Subic* (submarine integrated control) is a study concerning the development of a small nuclear-powered submarine in which many control functions would be handled by automated machinery. Such a submarine would require only about a dozen crewmen and yet would outperform current larger underseacraft. It has been estimated that this submarine would displace only about one-eighth as much as the *Thresher* class nuclear attack submarines. The *Thresher*, scheduled for launching in 1960, will displace 3,350 tons and cost about 43 million dollars. It has been said that the smaller nuclear submarine of Project *Subic* could be built for about one-eighth of this cost.—News item.

### Quadrotor Types

Various applications of the four-rotor helicopter design tested in the *Model A Quadrotor* (MR, Sep 1957, p 67) include a flying crane, a small two-place helicop-



**Foldable, large capacity flying crane**

ter, a three-ton helicopter transport, a four-rotor convertiplane, and a high-speed jet transport.

The flying crane, in an eight-ton capacity configuration, can be folded on its own landing gear and fitted into a *C-130* aircraft for aerial delivery to the place of its use.

The small two-place helicopter offers



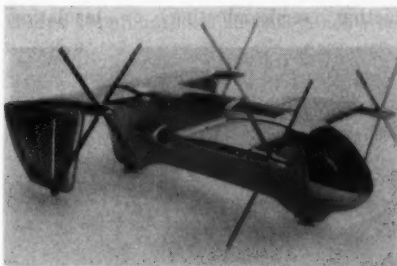
**Two-place quadrotor helicopter**

simplified smaller components combined with improved flying qualities. It can be produced for less than 50 percent of the cost of current Army helicopters, and has fewer total components in spite of the greater number of rotors.

The three-ton transport quadrotor *V-*

*30*, will be equipped with four *T34* power units, and have a cruising speed of about 220 knots and a range of approximately 1,000 miles.

The convertiplane, designated the *V-10*, is planned for three different configurations including a short-range model that can serve as a gun platform, a medium-range liaison or ground support aircraft,



**Model 10 quadrofoil convertiplane**

and a long-range assault-reconnaissance model.

The high-speed jet transport will have four jet motors mounted on the tandem wingtips. Ducted fans are set into the wings and driven by the exhaust gas of the turbojet engines. In this system no conversion is required for hovering flight and positive control is assured. It is said



**Model 30 three-ton transport helicopter**

to provide a solution to both the noise and landing space requirements of jet aircraft.—Commercial source.

### Tiny Radios

Radios as small as sugar cubes, using a completely new concept of micromodule circuits, have been developed successfully. The tiny radios are said to be highly dependable and long lived. They use little power, deliver high performance, and are extremely rugged due to their simplicity and monolithic shape. The smallest units of the micromodule are tiny flakes of conducting, semiconducting, or insulating



US Army Photograph

### Superminiaturized radio receiver

material one-hundredth of an inch thick and one-third of an inch square. These wafers do the job of specific components such as resistors, transistors, capacitors, and crystals.—Official release.

### Antitank Helicopter

The use of a very small helicopter has been proposed as an antitank weapon. To be called *Boomerang*, the weapon is actually a flying bomb which weighs about 70 pounds, and is fitted with rotor blades approximately six feet in diameter. The *Boomerang* would be guided to its target by remote control and would employ an infrared homing device.—News item.

### ICBM Facilities

United States Army engineers will begin construction of operational launching and support facilities for nine intercontinental ballistic missile sites during the

1959 calendar year. Facilities to be built include both *Atlas* and *Titan* missiles. All of the sites on which the work will be done have been announced.—Official release.

### Missile Units

The first *Hawk* and *Lacrosse* missile units are scheduled for early activation. The *Hawk* unit, latest in the Army's air defense weapons systems, will be activated early this summer. Its function will be to support the U. S. Army Air Defense School at Fort Bliss, Texas, in training future *Hawk* missilemen. It will test component equipment of the *Hawk* system in connection with the school's mission to develop organizational concepts, procedures, tactics, and techniques for air defense units.

The *Hawk* (homing-all-the-way-killer), is designed specifically to seek out and destroy hostile aircraft or air-breathing missiles traveling at twice the speed of sound at any height, from the lowest altitudes to present aircraft-operating ceilings. *Hawk* equipment is rugged, compact, mobile, and capable of being air-transported. The system can engage single, massed, or widely separated targets with a high rate of fire. Three 1,250-pound missiles are mounted on the *Hawk* launcher; normally six launchers are associated with each battery. Full-tracked vehicles are used to transport ready missiles from the battery storage area to reload the launchers.

Initially, two units are planned for the employment of the mobile, highly accurate *Lacrosse* surface-to-surface guided missile. These 170-man units will be activated at Fort Sill, Oklahoma.

*Lacrosse* units are designed to supplement and replace conventional artillery. The missile is controlled by a forward guidance station that also serves as an observation post. The *Lacrosse* system does not require precise data at the launching site.—News item.

### 'Sparrow III' Operational

The *Sparrow III*, the United States Navy's second-generation version of the *Sparrow* air-to-air missile family, is now operational with interceptors of the aircraft carriers *Midway* and *Bon Homme Richard*. The electronically controlled missile can be fired with greater aiming leeway than its predecessors since it contains



US Navy Photograph

### F3H-2 interceptor firing Sparrow III

inherent guidance which permits it to track down maneuvering targets. The all-weather interceptor *F3H-2* can carry four of the potent missiles and fire them singly or in rapid series.—Official release.

### Fuel Storage Unit

A portable bulk-petroleum products supply point assembly with a storage capacity of more than 60,000 gallons has been standardized. It consists of six 10,000-gallon collapsible storage containers fabricated of a coated nylon material, two dispensing and transfer pumps, a distributing manifold, two filter and water separators, six tank truck loading racks, and necessary hose and fittings. The equipment permits the unloading of three standard military 5,000-gallon capacity tank trucks and the filling of six 1,200-gallon capacity trucks simultaneously.

The system will be used to refuel combat tanks and trucks, and to fill 55-gallon drums and five-gallon cans. It can be con-

nected easily to receive fuel from pipelines, rail tank cars, fuel barges, and tankers. All components of the supply point assembly are truck or aircraft transportable, and the entire system can be set up for operation by eight to 10 trained men in six to eight hours.—News item.

### Antenna Tower

A 110-foot self-supporting antenna tower now under test has a one-ton extruded aluminum base section joined with a 925-pound laminated fiberglass tube supporting a pressurized radome. The



### Self-supporting radome tower

radome houses an ultra-high frequency radio antenna.

The tower can be raised and lowered by two men using a hand winch. The system is being studied to determine the feasibility of using pressurization of antenna cavities to prevent moisture condensation, a common source of malfunction in exposed installations.—News item.

## ECUADOR

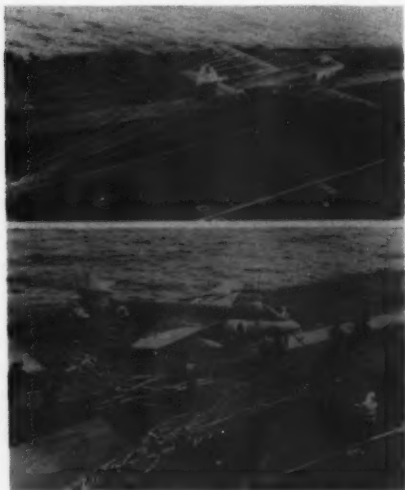
### Landing Vessels

Two United States amphibious vessels, *LSM-539* and *LSM-555*, have been purchased by the Ecuadorian Government and renamed *Jambeli* and *Tarqui* respectively. Personnel for the operation of the two vessels were trained in the United States before the transfer took place. These landing craft, which have a speed of 12 knots, displace 1,095 tons fully loaded and can carry and beach a combat cargo of five medium tanks.—News item.

## GREAT BRITAIN

### Elastic Barrier

The Spider's Web, in use on aircraft carriers of the British Royal Navy, is a barrier of elastic nylon strands that serves as an emergency safety device when an aircraft is unable to lower its arrester



*Seahawk* fighter in emergency landing

hook for a normal carrier landing. It takes about two minutes to place the Spider's Web in position for emergency use.—News item.

### Advanced Frigate

The *Ashanti*, first of seven planned *Tribal* class frigates, has been launched. The *Ashanti*, which is 360 feet long and displaces 2,800 tons, has a combined steam and gas turbine propulsion system that gives it a designed speed of 27 knots. This system permits the use of steam power for normal cruising and provides a gas turbine geared to the same propeller shafts for emergency use.

The *Tribal* class vessels will carry a helicopter for antisubmarine duties. Armament consists of two 4.5-inch guns in single mounts, antisubmarine mortars, and six 21-inch torpedo tubes. The vessels have a totally enclosed bridge, air-conditioned operations room, and remote controls for operation within an area contaminated by nuclear fallout.—News item.

### Nuclear-Power Project

Great Britain will pay the biggest share of the cost of a 38 million-dollar, 12-nation project to build a radically new type nuclear powerplant. The experimental plant, to be built at Winfrith Heath, England, will have a gas-cooled reactor designed to operate at temperatures above 2,000 degrees Fahrenheit. Commercial reactors such as the Calder Hall installation (MR, Nov 1956, p 79) operate at much lower temperatures. Nations participating in the construction of the reactor include Great Britain, Austria, Norway, Sweden, Denmark, Switzerland, and the six Euratom Powers—France, West Germany, Italy, Belgium, the Netherlands, and Luxembourg.—News item.

### Defense Missiles

The Australian-designed and built anti-tank missile *Malkara* is under evaluation for possible use by the British Army. The *Malkara* is a 200-pound short-range controlled weapon of extreme accuracy. It is intended to be launched from fighting vehicles against tanks, landing craft, and

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concrete emplacements. The British forces have ordered 150 of these weapons for field test and familiarization.

The *SX-A7 Seacat*, a development of the *SX-A5* research vehicle, is a short-range surface-to-air missile which will replace the 40-mm antiaircraft guns on the warships of the British Navy. Powered by a solid fuel motor, the small and maneuverable *Seacat* also will be used as antiaircraft armament for smaller vessels. A land-based version of the *Seacat*, to be known as the *Tigercat*, is being developed as a possible replacement for army light antiaircraft guns.—News item.

### **Turboprop Civil Transport**

The *Dart Herald* is a pressurized high-wing civil transport designed to operate from primitive airfields under a wide range of climatic conditions. It is powered by two *Dart Mk.527* turboprop engines each providing 1,910 horsepower to turn the prop-



### **Turboprop Dart Herald**

ellers and 502 pounds of jet thrust. It can carry as many as 47 passengers or five long tons of freight at a speed of 275 miles an hour.—News item.

### **Navy Yard Discontinued**

The British Navy's dockyard on the island of Malta has been turned over to a commercial concern for private operation. The dockyard had been in continuous operation for nearly 160 years.—News item.

### **Popular Fighter**

The *Hawker Hunter* fighter aircraft has been produced in 15 different versions. It is in production for the British Royal Air Force and Navy and has been supplied to the governments of Denmark, Iraq, India,



### **Hawker Hunter with Firestreak missiles**

Peru, Sweden, and Switzerland. All versions of the *Hunter* are supersonic in shallow dives. The *Hunter* is armed with four 30-mm *Aden* cannon in a package in the underside of the fuselage nose, and is equipped with radar and gyrogunsights. Various underwing armament of rockets, bombs, or fuel tanks can be carried. The underwing mounts also can be modified to permit the carrying of two *Fireflash* or *Firestreak* missiles.—News item.

## **CYPRUS**

### **Army Plans**

The planned 2,000-man army of the new Republic of Cyprus will be 60 percent Greek and 40 percent Turkish. Great Britain will retain control of two areas on the eastern Mediterranean island for use as military bases, and has jointly agreed with Turkey and Greece to guarantee the "independent territorial integrity and security" of Cyprus. In a separate pact, Greece, Turkey, and Cyprus have agreed to join forces against an aggressor threatening any one of them.—News item.

## DENMARK

### Reduction in Force

Denmark's permanent armed forces will be reduced from 24,000 to 20,000 under her latest defense plan. The size of the army will be cut from 16,000 to 13,000 and the number of fighter squadrons in the Danish Air Force will be reduced from eight to four or five with new types of fighter aircraft. One US *Nike* rocket unit also will assist in air defense. Under the plan, compulsory service will be cut from 16 to 14 months, with a further cut to 12 months following a recruiting drive for long-term voluntary enlistments. Planned expenditure for defense purposes is expected to be 975 million kroner (about 140 million dollars).—News item.

## USSR

### Foreign Aid Increased

The Soviet Union and her satellites signed aid agreements with nations outside the Iron Curtain totaling more than one billion dollars during 1958, an increase of about 700 million dollars over the preceding year. Some of the Soviet bloc's larger commitments last year included:

#### Egypt

Development projects	175 million
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Large arms credits	?

#### Argentina

Petroleum development	100 million
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#### Indonesia

Military and economic aid	225 million
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#### Iraq

Credit for arms	120 million
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#### Ceylon

Development projects	40 million
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#### India

Foundry and refinery	32 million
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#### Yemen

Transportation projects	41 million
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Since 1954, seven countries in the Middle East and South Africa, seven in south and southeast Asia, two in Europe, and

two in Latin America have received a total of 1,602 million dollars in economic aid and 782 million in military aid from the Soviet bloc. The United States, in the past 10 years, has given these same 18 nations over six billion dollars in economic aid and 2,623 million in military aid.

The United States also has assisted many other countries. During this same 10-year period, the US provided about 25 billion dollars in economic and military aid to 55 less developed nations of the free world.—News item.

### Fastest Fighter

The Soviet Union's fastest fighter aircraft is the *MiG-21 Faceplate* interceptor which attains a top speed of Mach 2.25 at 33,000 feet altitude. Some of the squadrons of the Soviet Interceptor Command (IA-PVO) have been equipped with the *Faceplate*. It has appeared in China, and the East German Air Force is being trained to operate the aircraft. With a high sweep-back of the wing—57 degrees—the *MiG-21* resembles the British *P.1* in appearance. It does not have the coke-bottle shape of US aircraft, and is said to be somewhat unstable at lower speeds, reducing its effectiveness in ground support roles. A rocket motor with a thrust of about 4,000 pounds is mounted in a bulge under the rear fuselage of the aircraft.

The single engine of the *Faceplate* is a modified *AM-3*, which is also used in the *Tu-104* transport plane. This engine has a thrust of 18,000 pounds, or 22,400 pounds with afterburner. Armament of the *MiG-21* consists of two 20-mm and one 37-mm cannon mounted below the nose of the fuselage. A retractable tunnel with eighteen 85-mm unguided rockets is located just behind the nosewheel section. The all-weather radar of the aircraft is adapted to air-to-air missiles, and four Type *M-101A* infrared homing missiles can be carried in underwing mounts of the *Faceplate*.

Characteristics of the *M-101A* missile are not available. The infrared air-to-air missile of the Soviet Air Force previously reported was the *M-100A*, a comparatively simple solid rocket propelled weapon that has a range of 3.4 miles and attains a speed of 1,750 miles an hour.—News item.

## CANADA

### Civil Defense Shift

The army is to play a greater part in the revised Canadian civil defense organization. Under the new plan, the army will take over from civil agencies the responsibility for warning of attack, locating and monitoring explosions and radioactive fallout, assessment of damaged areas, decontamination and clearing of damaged areas, and rescue of the injured. The army will use reserves and local auxiliaries to assist in these tasks.—News item.

## PAKISTAN

### Bombers to Be Received

Pakistan is to receive about seven or eight twin-jet *B-57* tactical bomber and *Night Intruder* aircraft from the United States under the Mutual Security Act. The planes, scheduled for delivery late this year or early next year, will be the first bombers sent to Pakistan since the United States began her aid program to that country in 1954. Previous aid consisted chiefly of trucks, small tanks, other ground vehicles, and about 100 aircraft, mostly transports. Other aircraft delivered have been five *F-86 Sabre* jets, and *T-33* jet trainers.

The *B-57* is the United States-manufactured version of the British *Canberra*. The United States uses the plane for reconnaissance. It carries a crew of two men and is armed with eight wing-mounted, 50-caliber machineguns or four 20-mm cannon as well as rockets. It features a pre-loaded revolving bomb bay door.—News item.

## WEST GERMANY

### Rocket Craft

The West German Navy is considering the possibility of putting into service a number of 100-ton submarines armed with two torpedoes, or equipped for firing small rockets. Also under consideration is a surface vessel of about 2,000 tons to be equipped for firing rockets.—News item.

## AUSTRALIA

### Different 'Jindiviks'

The high performance, radio-controlled target aircraft *Jindivik* is produced in four different versions.

The *Mk. 2* has a service ceiling of 50,000 feet and a top speed of 570 miles an hour. The *Mk. 2A* model has extended wingtips, improved cameras, and a ceiling of 52,000 feet.

The *Mk. 2B* is equipped with a *Viper* *ASV.8* engine that provides 1,750 pounds of thrust, and the *Mk. 3* has the still more powerful *Viper* *ASV.11* turbojet, giving it greater speed and a ceiling of at least 60,000 feet.—News item.

## AUSTRIA

### Nuclear Supplies

The United States, Great Britain, and the USSR will supply the nuclear materials for the International Atomic Energy Agency. The United States will provide 5,000 kilograms (more than 11,000 pounds) of Uranium 235 at the US Atomic Energy Commission's price for domestic sales. The US also will provide, at the same price, an additional quantity to match the total of all supplies of member nations as of 1 July 1960. In addition, the United States has offered \$500,000 to build a laboratory near Vienna for work on standardization of isotopes, and on instruments, measurements, and analysis. Under this plan Great Britain will supply 20 kilograms of Uranium 235, and the Soviet Union, 50 kilograms.—News item.

## FRANCE

### Antitank Missiles

The United States Army has ordered an undisclosed number of French-made *SS-10* antitank missiles (MR, Dec 1957, p 70) for use by its forces in Europe. A quantity of *SS-11* missiles also are being procured for evaluation purposes.

The *SS-10*, with a range of about a mile and a speed of 180 miles an hour, can penetrate more than 16 inches of steel plate. The *SS-11* has a range of more than two miles, a speed of 425 miles an hour,



*SS-11* mounted on *Allouette II* helicopter

and can penetrate almost 20 inches of steel plate. Both weapons are solid propellant two-stage rockets using wire control guidance systems. Training of operators in the use of the two rockets is said to have reached the point where an average operator can obtain 80 to 90 percent hits. The missiles are launched from the box in which they are transported, and the ground

equipment of the two weapons generally is interchangeable. According to French sources, the warhead of either missile can knock out any tank in existence today. Both missiles can be hand-carried, dropped by parachute from planes, operated by one soldier, and launched from the ground, a vehicle, helicopter, or airplane.

Other foreign-made antitank missiles that have been under consideration by the United States are the German-designed *Kobra* and the British *Vigilant*. The *Kobra* is a solid propellant rocket weighing 26.5 pounds. It has a range of one mile and carries a 5.5-pound warhead. The *Vigilant* can be transported in a waterproof bag complete with tubular zero length launcher, the package weighing about 35 pounds. It has a range of one mile and attains a speed of about 350 miles an hour. The warhead of the *Vigilant*, which is fitted with a retractable contact probe, can be equipped with various high explosives, including a hollow charge. Both the *Kobra* and the *Vigilant* are controlled through wire command guidance.—News item.

## ITALY

### Antisubmarine Center

The United States Navy and eight NATO allies will cooperate in establishing an antisubmarine research center at La Spezia, Italy. The installation, to be staffed by military and civilian scientists of the principal seagoing nations of NATO, will operate under the supervision of the Supreme Allied Command, Atlantic.

The United States Navy will contribute eight officers and seven enlisted men to the project. Similar teams will come from Great Britain, France, Italy, West Germany, the Netherlands, Norway, Denmark, and Canada. Preliminary construction work on the research facilities already is under way, and the US is reported to have set aside 2.5 million dollars for the development of the center.—News item.

# MILITARY DIGESTS

## The Natural Strategic Bastions

Translated and digested by the MILITARY REVIEW from a copyrighted article by Major General Emile Wanty in the "Revue Militaire Générale" (France) May 1958.

THE reduced forces that the West will have at its disposal in the face of aggression leaves little choice, other than one of three solutions:

1. Continued occupation of defensive positions more or less in full strength utilizing local reserves on the point or points under attack.

2. Continued occupation, but in reduced strength (a type of light covering force) with larger and better deployed regional reserves.

3. Scattered occupation of naturally strong areas.

The first formula leads to a certain checkmate. Our global forces are not only far inferior to those of the aggressor, but also inadequate to the occupational needs of the immense European Front. The defending force always will be weaker than the assailant in a sector that has been broken through. Even though the troops in the vicinity are not under direct attack, they certainly will be immobilized—if for no other reason than by the atomic threat—and, therefore, cannot be made available for battle purposes.

The second formula is based on the offensive maneuver and the reaction thereto, but does not exclude the possibility of the enemy breaking through the screen at another place well removed from the first point of attack. Therefore, the units in

reserve must be prepared to move in several directions.

The third solution is, all in all, a revival and an adaptation of the old "position defense," of strong points directly commanding certain invasion routes and indirectly commanding certain other routes. This solution admits the lack of defensive positions in more or less extended parts of the over-all frontline and the distribution of defensive and offensive means between the regions of greater strategic defense value.

### Defense Regions

The characteristics of these regions will vary widely, but they will have certain traits in common. These are:

1. The existence of natural and fortified obstacles along the periphery and in depth.

2. Established communications with the sea or the rear.

3. Flanks that can be protected economically.

4. An independent command in the framework of a decentralized high command.

The varying features depend especially on the economical and industrial contributions of these regions to the community of nations involved, and on the role that their geographic situations indicate in the over-all strategy.

An example of this is to be found in the complex of Denmark and the southern part of Norway which involves the control of the straits, radar screens, launching bases for ballistic missiles to carry out retaliatory operations, and bases for the operation of naval and amphibious aviation. Similarly, there is the situation of the southern part of the Netherlands and the northern part of Belgium. Here we must consider possession of large ports, railheads of communications leading to the defense positions, numerous strategic bases for aviation, and tactical bases.

Therefore, a number of strategic regions are considered as having the nature of a vast entrenched camp that is separated by passages or "gaps," but connected, in the strategic sense of the word, by the omnipresent weapon—aviation.

#### Attack Possibilities

The assailant must succeed in breaking through this line of fortification. This having been accomplished, such operations as movement to outflank the defending force, double envelopment, and thorough exploitation in the presence of partially engaged weak reserves can, as in 1940, decide a phase of the campaign. These possibilities are lessened if they are faced by a defensive disposition strategically staggered in depth.

On the other hand, the aggressor might attempt to conquer the various areas one by one; in that case we are once again faced with the old type of siege warfare. The defender retains part of his freedom of action; he can draw reserves from task forces of the regions that are not yet threatened, thus reinforcing the main body of committed troops. These areas also constitute possible attack positions against at least one of the enemy's flanks.

There is, of course, a possibility that the latter might attack several regions simultaneously over a broad front. He would have to move up considerable strength,

ignore the principle of mass (which is the recognized privilege of an offensive maneuver), and redistribute his aerial forces over several targets. Here again there is the possibility of a counterattack or at least a tactical atomic reaction, if the assailant is brought to constitute rewarding targets.

Also the enemy might infiltrate through the gaps in order to reach the flanks or even the rear areas of the regions. This would be a maneuver similar to the drive toward the English Channel in May 1940, but with one essential difference—that is, the existence of latent threats on his own flanks and on his lines of communications which obviously impose limitations on his isolated positions.

We see here, on an entirely different scale, of course, a striking similarity to the role of the series of fortifications that covered the north of France in the 17th century, and that were never broken through.

One cannot linger on these analogies, since the means at the disposal of an offensive maneuver today are out of proportion to the past. But we can admit that, except for the troop strength and the artillery equipment, the lack of balance will not be so enormous in the field of armament—quantitatively and qualitatively speaking.

#### Territorial Unity

The contours of a strategic region such as this cannot be delineated at random. It is no longer a question of solely defending a national territory, the borders of which frequently offer no strategic value at all. The Western countries are integrated in a defense alliance under a unified command. Henceforth, it is not only permissible but it is indispensable to disregard political borderlines in military matters.

To an interallied staff, under its single strategic aspect the problem appears to be less difficult than was the planning of

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operations in the old days, which was based on the framework of territorial limits. Disregarding national borders restores the geographic, hydrographic, and strategic unity of natural regions previously partitioned by boundaries.

To quote an example that concerns four NATO countries:

Looking at a general map of western Europe, the eye is attracted by a natural region which seems capable of assuming the role of a vast strategic bastion in a central and flanking position to the Eifel and the Ardennes. The Eifel region served twice (in 1914 and 1940) as a line of departure for the combined offensive and once, in December 1944, it was the base for the limited offensive of the Ardennes. Twice also (1914 and 1940) the other side neglected to incorporate the Ardennes as an "active region" in the strategic deployment of the defensive.

Covered from a distance by the trenches of the Rhine between Bonn and Koblenz and with the wide slopes of the Rhenish plains, the Eifel offers its hills, deep indentations, concealed terrain, and screening effect against the atomic threat. It extends past the Ardennes with its immense plateaus affording extended observation interrupted only by its valleys. This strategic region is closed off by the upper Meuse. In the north its flanks are covered by the valley of the Vesdre, and in the south by that of the Moselle, which delineates the area as being something like an autonomous region.

In this geographic entity which extends over about 75 miles in depth and 45 miles in width (from north to south), the static position defense, delaying action, and guerrilla fighting can succeed or alternate with one another.

#### The Past

The recollection of some dates of 1944-45 may be useful. On 15 December 1944 the United States First and Ninth Armies were halted for weeks near the boundary

between the Ardennes and the Eifel regions. The four divisions located in a defensive line of over 80 miles were broken through on 16 December. Supporting points, however, held out. They were at Montjoie, the canal to Butgenbach, Vielsalm, Stavelot, and Bastogne. The positions of 15 December were not entirely reoccupied by counterattack until about 24 January. Not until 7 February did we see a bridgehead established on the other side of the Sauer River. Because of the voluntary rupture of the Erft dams by the Germans, the United States Ninth Army could not emerge into the open from the vicinity of the Roer before 24 February. In the Eifel, the United States Third Army passed the Our and Sauer Rivers on 8 February. On the 12th Pruem was taken, but the river of the same name was not forced until the 25th of that month. A bridgehead on the other side of the Kyll River was established on 5 March.

Here and there the pace of operations was slow; the Ardennes-Eifel mountains do not lend themselves to a "blitzkrieg"; rather, an inch by inch fight was necessary. The valleys and the mountain passes all were obstacles. They constituted obstacles for the use of armor in mass formation, while much natural cover afforded concealment for the distribution of units and the terrain formations increased the possibility of protection against atomic attack.

These natural conditions raise difficult problems to the artillery, which is one of the superiority factors on the Allied side as far as conventional armament is concerned.

One might think that in general the initial lack of stability would be partly compensated for by judicious use of this unusual terrain that is, by thorough exploitation through systematic attack, first on the outlying areas and later in the interior. This would at least furnish the time which seems vital to the Western strategy.

### Characteristics

It should be pointed out that we have chosen the most typical case. We have been attracted to it in the first place because of its central location in or behind a West-

2. The mountain chain of the Vosges with the Moselle as an obstacle in its rear.

3. The northern region of the Jura Mountains.

4. Veritable bastions exist on the banks



ern front. However, we recognize similar characteristics in other locations such as:

1. The mountains of The Hardt that are bounded by the Rhine from Mainz to Mannheim, the course of the Nahe River, and the obstacle of the Saar.

of the Rhine, leaning against the river like bridgeheads in the regions between the Lippe and the Wupper, the Westerwald-Taunus, and the Odenwald between the Main and the Neckar Rivers.

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the wide open spaces," but of an adaptation of modern armament and of the necessary dispersion which the atomic threat imposes. This adaptation also is one of the obsolete formulas of closed fortifications constituting a net from which the attacker cannot extricate himself other than by taking them one after the other, which necessitates two or three campaigns.

### Strategic Concentrations

The part that these fortifications played was most important when, rather than shut themselves off from these positions, the committed armies used them as an operations base. It is no longer necessary to sink billions into the construction of permanent fortifications that have the double disadvantage of leading to the position defense concept and furnishing valuable information to the potential enemy. Stalingrad is a convincing example of the influence of an urban area improvised as a fortified center.

The concentration of active strength in naturally strategic locations would permit the conduct of a defensive-offensive type operation. This, however, would make it mandatory to abandon the corridors and the more or less "wide open spaces," which in turn would provide just that many more temptations for the eventual aggressor. This is the usual objection, and it obviously is well-founded as far as very open tactical dispositions or a strategically dispersed defensive system are concerned.

### Blocking the Gaps

We believe that it is possible, to some extent, to remedy this situation which is imposed not only by the relative weakness of our troops but also by the requirements of nuclear warfare.

The gaps could be blocked off by natural "curtains" that are flanked by the positions behind them and which consist of fortified regions.

Some examples are:

1. Between the regions of the Eifel—

Ardennes and the Rhine—Rotterdam and Antwerp, a junction can be effected by the Meuse obstacle, reinforcing it in depth by a line of waterways.

2. Between the Eifel—Ardennes and The Hardt, between The Hardt and the Vosges and the Saar.

3. Between the Eifel—Ardennes and the Vosges, and farther back, the Moselle.

First of all, armored spearheads and light detachments tailored for exploitation should be considered as far as the defense of the open corridors are concerned. In a major emergency the space between forts could be economically held by using defensive positions located in avenues of approach. Later, the local mobilization of troops for the defense of the interior would permit the reinforcement of these initial forces and thereby constitute a nucleus of the continuous frontline.

Total war no longer hesitates to devastate systematically certain areas in order to slow down a rapid advance. But total destruction strategy on a vast scale is unthinkable in our Western countries. Besides, in the case of a sudden breakthrough of an extended front (such as the one of the French upper Moselle in May 1940), this strategy could not be executed due to lack of time.

On the contrary, in the corridors or gaps the deliberately abandoned spaces between two defensive strongholds and the space to the rear that links them together could be evacuated according to a preconceived plan. The destruction in depth of the rail and road communications system would make its full use very difficult since it would be exposed to destruction by atomic weapons. The task of reconstruction of constructed works such as bridges would be hindered through guerrilla raids, paratroops, and other specialized units.

### Organization

In the event of a major emergency, the West would have at its disposal only a very few divisions, for the classical con-

cept of an uninterrupted frontline would not guarantee the ability to mobilize and to commit reserves in time.

The quantitative weakness of the immediately available troops must be remedied by mobility and maneuver. These scarce and precious divisions cannot be committed to a purely static occupation.

Besides the large units earmarked for counterattack, equipped with the most modern weapons and staffed by young, alert, and dynamic leaders belonging mostly to the regular army, we believe it possible to create another type of organization. This organization would be destined principally to occupy defensively the naturally strong strategic areas and the spaces between them. A local and rapid mobilization would be prepared. The cadres of such formations could consist of officers and noncommissioned officers of the reserve especially trained for more limited missions.

Such a distinction between defensive and maneuver troops might be called an expedient or even an old-fashioned solution. But in all objectivity it must be recognized that we find ourselves at a dead end, because the West has not known how to get the most out of its demographic resources. Rather than to accept the idea that our salvation depends exclusively on atomic retaliation and on the resistance of our divisions presently earmarked for counterattack at a ratio of one against three, should we not look for other ways to carry out the missions that the Western defense imposes on us?

### Logistics

Not too long ago the rear area was safe from all ground troop threats, and only exposed to aerial bombing. In the future, the danger of total destruction by thermonuclear warheads and the use of airborne troops and guerrilla forces against communication lines must be considered.

The problem changes completely in its perspective. In the future, a closer rela-

tionship between logistics and the over-all military force is essential. The safety of communication lines makes the following mandatory: static units at critical points such as road junctions and bridges; mobile units of combined arms trained for rapid concentration and attack; troops especially trained in antiguerrilla warfare; a great number of engineer units; and an effective anti-aircraft protection.

The utilization of vast geographical areas as strategic bastions would allow this tactical and logistical integration. All large commands such as field armies and rear area commands should be stable, devoted to the portion of the area assigned to them and to their mission. This is the connotation of the Soviet term "front," with respect to the army group level. Only the divisions (or the more reduced combat teams of the future) would be the interchangeable elements in an area where the complete logistical and tactical system would have been set up in advance.

On the other hand, the study and systematic utilization of the characteristics of certain geographical areas, especially from the geological viewpoint, would facilitate dispersion and concealment. For a combat unit these two last requirements find their limitation in the necessity of fire coordination and the ability for immediate action. This is not true for logistics. Camouflage and the use of underground facilities can give logistical installations a good static protection.

This discussion started from a historical assertion and ends with a question. In 1914 and in 1940 the avenues of approach leading to central Belgium had to be abandoned without a fight because the decision had fallen elsewhere, in the Ardennes.

But let us consider the other extreme. Let us assume that at all cost positions in the naturally strong areas were to be held. The question is: Would a deep penetration in the intervals be possible and could it be of lasting success?

## Training for Soviet Underground and Espionage in West Germany

Translated and digested by the MILITARY REVIEW from an article by Dr. Johann Kurt Klein in "Truppenpraxis" (Germany) February 1958.

*The first part of this article appeared in the February 1959 issue of the MILITARY REVIEW under the title of "The Soviet Espionage System in Germany.—Editor.*

THE training of Communist underground and espionage agents exhibits a thoroughly planned system. Roughly, it consists of preparatory, basic, and specialized schools. The first group, particularly, is represented by the *Kreisjugend-schulen* (Circuit Youth Schools). Here, dependable Communists (especially juveniles) are subjected to a propagandistic training in courses of four to six weeks, and receive preilitary basic training. Numerous Communists, leftist Socialists, and neutralists from Western Germany also take part, often under an alias. Graduates perform special party assignments in the Soviet zone, and are considered to be the young generation of party officers.

From among the participants in the preparatory courses, the more able Communists are selected for further training in District Youth Schools of the Soviet zone. The requirements are considerably higher than in the Circuit Youth Schools and similar institutions. In addition to an intensive ideological indoctrination, there is thorough training in underground tactics and military skills.

The ones who pass these basic schools to the satisfaction of the party can count on further special training at one of a dozen different schools. There are such training centers, more or less well-camouflaged, in all parts of the Soviet zone. For instance, the *Fachschule des Ministeriums für Verkehr* (Professional School of the State Department for Transportation) is

given the task of training agents in the sabotage of ships. The specialized schools in Potsdam-Golm, Eberswalde, and Greifswald, directly subordinate to the Department of State Security, train full-time agents for the State Security Service.

Those who pass successfully have the chance to go to the Soviet Union for further training. The curriculum displays an amazing intensity in training with frequent quizzes requiring hard work on the part of the students.

One of the most important aspects of this training is the undermining of the agent's personality.

### Destruction of Personality

Communism demands absolute obedience. Everything that opposes unconditional accomplishment of orders has to be removed from the human personality. An agent's personality is entirely subjugated to the exchangeable personality which is an essential part of the so-called *Linientreue* (loyalty to the party line).

A central part of the agent's training is the change of identity. This does not take place solely for reasons of security. It is indispensable in the process of destroying one's personality. The young Communist from West Germany, attending a school for agents in the Soviet zone, is given an alias, new papers, and a new dictated story of his life. What, superficially, may appeal to the thirst for adventure of younger people actually is aimed at a much higher goal. An agent who has to change his name and the story of his life again and again at the orders of the party, eventually will lose contact with his former personality. He gets accustomed to being the person the party wants him

to be. More and more he becomes similar to a vessel that can be filled with any contents the party likes. Along with this undermining process of personality destruction goes a permanent ideological indoctrination. The doctrine of dialectic materialism becomes an almost religious force to the true underground Communist, giving him an unscrupulous conviction of his mission, and making him capable of anything.

He gradually loses every relation to whatever might be left of the values of his former personality, due to the steady change of his identity. In practice, this transformation of the human personality constitutes an almost ideal camouflage in the non-Communist environment and against the opponent.

However, before the young generation of agents is fit for Communist underground and espionage, they have to endure a severe education aimed at firmness of will and mastery of mind and body for the organization. The goal of this education determines the training method in the basic schools and in the specialized schools.

A simplified and idealized example will demonstrate this training method. Student agent A (with prescribed identity) rooms with "comrades" B, C, and D in one of the specialized schools. By written obligation all students have bound themselves to keep strictly secret all things pertaining to school, and all information about their original identity. Therefore, A, B, C, and D know nothing about one another but their code names. Private conversation is strictly prohibited. After four weeks each occupant of the room has to write a report about his three roommates. He has to report what conversations they had, what ideas have been expressed, and, a very important point, which ideas have not been expressed but have been concealed.

The problem of this assigned report—

appearing to be nonsense at first sight—on closer examination turns out to be an integral part of a very efficient training method.

Since A knows that he has to write a report about B, C, and D, he observes his comrades well. He has to pay attention not only to their utterances, but also has to search for the thoughts concealed behind their words and gestures. As the time passes, he learns to search for the ideas and intentions of his partners in a conversation. Moreover, through this systematic espionage of thoughts, he arrives at a perfect mastery of his own words and gestures. A knows that B, C, and D also have to write reports about him. He will endeavor to keep to party approved topics in conversation, to conceal all "individualistic" thoughts, and to watch carefully the impression of his own words on his partner in the conversation. The acquired ability to observe and self-discipline are of the highest importance for Communist espionage and underground activity.

During their training the occupants of the rooms are exchanged according to a thoroughly planned system. Thus after a certain time, A will be in a room with comrades E, F, and G, while B will be in still another room with H, I, and K. In this manner the directors of the school are able to get extensive material about each participant for their files, in addition to the reports of the instructors. The evaluation of this material allows a clear over-all judgment of the agent's personality, attitudes, and capabilities.

### Criticism and Self-Criticism

Like the change of one's identity and espionage of thoughts, criticism and self-criticism are important tools in depersonalization. The student agent, just as the Communist official, has always to expect the criticism of his superiors. It is less a correction of his work than a method of enhancing his readiness and his feeling of dependence. Communist automatons be-

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come insecure unless they can feel the whip of continuous criticism. Thus by the party's system of constructive, admonishing, and reprimanding criticism, the effects of which propagate down to lower levels, the leaders of the party succeed in getting their decisions unconditionally accepted as *ultima ratio*. The slogan "the party is always right" is not empty talk, but the most important principle of the entire Communist ideology.

The orders of the Politburo were accepted with an almost religious veneration as the emanation of supreme human wisdom. Although indications of a weakening in certain discipline matters became obvious after Stalin's death, this does not mean that the agents of Soviet espionage and the collaborators of the active underground gave up traditional discipline.

The so-called "self-criticism" is a necessary complement and reflection of criticism. The comparison with the Christian confession is obvious, especially since dialectic materialism is a pseudoreligious philosophy. In both instances, self-criticism must be preceded by knowledge of oneself. In both instances, the absolute is the logical end of the purification of one's conscience. These similarities are only superficial, however.

The Christian's conscience is God's voice within him. It enables man to find his way anytime in accord with the ethical laws of the church. If we talk about a Communist's "conscience," we have to keep in mind that for him there are no timeless ethical standards. Only one principle is valued as irrefutably good—anything that is useful for releasing the world revolution, and for the advancement of communism. Anything that is not aimed at these goals, or that is adverse to their advancement, is evil and to be destroyed. One has to study this principle very carefully in order to realize the totality with which the Soviet system opposes the opponents as well as the neutrals. Temporary periods

of tolerance, although possible, are accepted only for "tactical" reasons.

Publicly, the Communist prostitutes his own personality in order to defame it systematically. If he was a former bourgeois, he frequently starts his disclosures with extensive description of the wickedness of the bourgeois society. Earlier ideals become almost criminal and, therefore, the conversion to communism appears to be a rebirth. There is always the same pattern: If real acts against party discipline are lacking, trifles are puffed up, or "heretic thinking" is invented.

Thus everything that belongs to the original personality is destroyed. Henceforth the agent is endowed with a "personality" forced upon him. He is in a state of complete dependency, fit to live only because of the umbilical cord tying him to the control center of the Communist organization. Unfortunately, the West often underestimates the influence of criticism and self-criticism on the personality transformation of the Communist.

#### Preparation for a Task

To a considerable degree, training methods take individual knowledge and abilities into account. Those who have experience with explosives, who master radio communication, and those who have proficiency in foreign languages can count on being assigned to an adequate mission. Positive as well as negative abilities are used. Fakers, criminals, and perverse persons also are drilled for tasks matching their characteristics. Innumerable known cases show how systematically all human virtues and vices are used to serve the purpose of espionage.

Sociability also is very important. Agents are drilled to move in academic, bourgeois, or labor circles, depending on their future field of activity.

It does not take too much effort to imagine to what extent female Communist agents must sacrifice their personalities. Their mind and body is completely at the

orders of the control center. The history of Soviet espionage in Germany abounds in human tragedies waiting to be told.

Preparation for the agent's first major assignment takes place only if the obligatory test assignments have been satisfactorily accomplished. Then, he will be sent on a mission of secondary importance, continuously checked by other agents. In order to get comparisons, several candidates frequently are assigned the same task. All are well-prepared for the possibility of arrest and questioning by police. Frequently, they know as much about the pertinent paragraphs of the law as the law officers in charge of their questioning.

Preparations for an important assignment may take much time, depending on circumstances. Many cases have been known where agents have been drilled for years for a particular espionage assignment, sabotage act, or attempt on someone's life. Before he leaves the place of training he gets exact information about the locality of his assignment and the persons with whom to get in touch. A simulated example will clarify this procedure.

Agent A has to "contact" captain X, company commander in the West German Armed Forces, in order to induce him to divulge a military secret. From the large files in the center, A learns what captain X looks like, what is known about the history of his life, and, most important, what human weaknesses X has. All this information has been brought together by innumerable agents engaged in doing preparatory work for espionage purposes. In most cases they are members of the local Communist Party groups.

If captain X should become talkative under the influence of alcohol, agent A will be informed about X's favorite drinks. If he has a weakness for blonde women, a female agent will be dyed correspondingly for him. The location of the barracks, the places he frequents, his leisure

time hobbies, and other important facts about the captain's life are discovered. They might become very decisive factors.

Let us assume that X talks more than he should when under the influence of alcohol, and likes to play chess. Presumably, A will approach X in those places where X usually plays chess. The contact is made with every precaution. The agent has to write a report about every conversation. For his further proceedings he receives strict directions. It may very well be that he is ordered to break up the contact. Months may pass until the center lets him put captain X under the influence of alcohol in order to obtain the desired information. In a critical situation, no method is denied to reach the goal. Persuasion, blackmail, bribery, and murder rank equally among these methods.

### Sources of Agents

The agents of Soviet espionage come from all walks of life. Many have experienced tragedies before they joined the Soviet espionage. In general, the following groups can be recognized for furnishing agents:

1. *Communist officials.*—These types come from all parts of Germany and are assigned to espionage activity only after they prove themselves to be dependable and capable in party work. Often the center knows facts with which the agent can be put under pressure in case he wavers in his loyalty.

2. *Corrupt persons.*—Persons who are corrupt in some way and, therefore, can be blackmailed, frequently are drafted for espionage assignments. The center threatens disclosures, the charged person is afraid of a scandal or a process, and gives in. In these cases one blackmail usually is followed by another. The person who hands himself over to Soviet espionage becomes an unscrupulously misused tool.

3. *Specialists.*—When there are difficult assignments requiring a high degree of

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specialized knowledge, soviet espionage applies the method of arresting and pseudo-sentencing suitable specialists and scientists within their sphere of power. When the condemned person is on the verge of breakdown, he is offered espionage work as a way out of his ordeal.

4. *Political prisoners.*—Political prisoners, after their release, find confidence and sympathy among the population, a factor which has been used by Soviet espionage on several accounts. The prisoners are promised release on parole in case they become agents. To meet the danger of desertion, the Soviet system usually keeps the relatives of the prisoner in the Soviet zone as hostages.

5. *Criminal and perverse persons.*—This category is used for underground activity to a very large extent. They are especially suitable for kidnaping, burglaries, sabotage, and seductions. Having committed a crime, they are particularly ready for underground work which saves them from being tried.

All spies and underground agents of the Soviet system are subject to special jurisdiction. Upon their engagement the agents have to sign the obligation to accept these rules of exception from normal jurisdiction. When they become punishable under this extraordinary jurisdiction, they face long sentences to forced labor, and occasionally even the death penalty. In these cases, liquidations are not always made on the basis of a lawful "death sentence," but often are carried out secretly. Deserters are not tried in ordinary courts, but are tried "administratively," that is, by decision of the administration, without possibility for defense or appeal.

The large number of untrained collaborators and informants is characteristic of Soviet espionage. The trained cadre agent engages them to collaborate, but frequently they do not know that they work for the Soviet espionage. Some type of blackmail often is involved in these cases. If they

want to evade the pressure of their employers, they face heavy reprisals.

### Limitations

To the layman this closer look into the Soviet espionage system will give the impression of a monolithic compactness. He probably will even be inclined to assume that Soviet espionage can achieve anything and that it is omnipresent. Thereby, he falls prey to the suggestion intended by the Communists. Soviet espionage uses all propagandistic means to look almighty. However, a knowledge of the methods and facts reveals a considerable number of weak points.

The misuse of humans by the destruction of their personality, which seems to be an almost unsurmountable strongpoint, actually weakens the efficiency of underground activity in many cases. Innumerable agents have deserted, and many have disappeared somewhere in the mass of passive people. Again and again one of the chief arguments is the inhumanity of the espionage system. The ideological leveling of communism does not succeed in all cases in destroying the moral ties to the former personality. On the contrary, human nature is opposed to inhumanity—in the field of espionage. The ever-present suspicion is a further psychological weakness. One agent is the "shadow" of the other. Denouncements, rivalries, and deeds of violence are commonplace within the organization.

The agents are overworked with writing innumerable reports, a consequence of the mutual mistrust. Every proceeding has to be recorded in writing. Again and again deserted Soviet spies have complained about the senseless paperwork which not only can break the camouflage, but is also done with the agent feeling that no one is going to read his reports. Soviet espionage, by one-sidedly increasing its extent, has lost efficiency. At the same time, Western secret services enhanced their own efficiency and the Soviets have suffered

tremendous losses of their organizations in the last few years.

Detrimental in its consequences to the Kremlin is the fact that the Western democracies keep secret only that which must be concealed, while the Soviets keep almost everything top secret. Consequently, a large portion of the Soviet espionage organization runs idle. On the other hand, the Kremlin has to use a large number of people to protect its secrets against imaginary or actual existing Western agents.

In spite of these weaknesses, we must not make the mistake of underestimating the really tremendous danger. During World War II, for instance, two Soviet agent groups—the “Red Chapel” and the “Red Three”—furnished important military secrets to the Soviets. As a result many a German soldier had to pay with his life for the activities of those spies. These saddening facts become even more distressing through the evidence that in all cases the Soviet agents pursued their activity through the ignorance, lack of vigilance, and indiscretion of many German officers and officials.

### Counterintelligence

In order to counter the extensive attack of Soviet espionage, two preventive measures are especially needed. In general, the citizens of the German Federal Republic and, in particular, the soldiers of the *Bundeswehr* (West German Armed Forces) have to realize the importance of the decision with which the free world is confronted in its argument with the Soviet system. Moreover, they also have to be informed about the facts and the system of Soviet espionage.

Only a small part of the damage caused

by Soviet espionage can be identified, nor can it be expressed in exact figures. Its importance can be defined by stating flatly that the freedom and existence of the nation are perilously endangered by Soviet espionage.

The well-known man on the street has played a vital part in almost all discoveries of Soviet espionage activity. As it is in civil life, so also in military life. The experiences of the past make it absolutely necessary that all soldiers are informed about the political-totalitarian character as well as the technical-systematical features of Soviet espionage. It is the troop officer's duty to provide his soldiers with the basic information and to awaken their vigilance.

It would be foolish to create an over-all fear of agents. This fear thrives only on the basis of lacking knowledge about the opponent's positions. Nothing is more essential than the conviction that secrecy is an indispensable part of the security of the nation, and of the freedom for every citizen.

The decision about the secrecy of a fact cannot be left to the subjective judgment of the individual soldier. Small items of information gathered by the enemy provide him with deep insights. The argument: “The Russians have known these facts for a long time” is foolish and wrong from the factual as well as from the psychological point of view. The principle that the strength of Soviet espionage lies in our own ignorance and lack of vigilance has been proved a thousand times. It is also true that Soviet espionage has its limitations, too, if only we study its methods and take efficient preventive measures by individual vigilance.

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## Soviet Seapower--Psychological Factors

Digested by the MILITARY REVIEW from a copyrighted article by J. Meister in "The Navy" (Great Britain) March 1958.

ONE of the catch phrases most heard outside Russia is the comforting statement that the *Russians are not good seamen*. Of course, compared with the British or French, who do much more ocean navigation and are more accustomed to taking risks, the Russian is still somewhat inferior. Remembering the poor maneuvering noted during the Russo-Japanese War or when the battleship *Marat* came to the Coronation Review in 1937, things have certainly improved. Many will recall the superb handling of *Sverdlov* in 1953.

Soviet warships, which between the two World Wars paid few visits to foreign ports, now undertake frequent cruises abroad; and Soviet submarines are reported almost everywhere—although many of these reports probably are erroneous. Seamanship, which was very important during the sailing ship period, is less important on board a modern submarine; much depends now on skilled engineers. Although ice in the Baltic forces the Russians to lie four or five months in harbor, and, therefore, they have less opportunity to get to sea, they certainly have an excellent knowledge of their own coastal waters and severe Arctic conditions. These factors should not be underestimated.

### Shortage of Sailors

Another argument is that the *Russians are short of sailors*. This is certainly not true. Russia has never had enough men in her merchant navy or fishing fleet to provide the navy with sufficient personnel, but this was also the case in almost all other countries. However, contrary to experience in the British Royal Navy or the United States Navy, the Russians never had any difficulty in securing the numbers needed to man their ships, either as

volunteers or as long-service (14 years) conscripts. This is most surprising, since service on Russian warships always was subject to very strict discipline, life was rather dull and, in the opinion of the average Russian, the Soviet Navy does not possess the glamour the British Navy has for Britons.

The tremendous peacetime strength of the Soviet Navy is, by itself, proof that trained manpower is not lacking—with the organized reserves over one million sailors are available.

This is not exclusively a Soviet achievement. During the Crimean War the Russians were not short of sailors. Later, during the Russo-Japanese War, they lacked not sailors but good officers and engineers. According to American statements the Soviets are, at the present time, producing more engineers and technicians every year than the United States. This shortage is, therefore, not likely to occur again.

### No Leaders

*The Russians do not have gifted naval leaders* is another catch phrase. Some of the czar's admirals were good officers, others were not. So far the Soviets have not produced an admiral of even average talent and luck.

Up to the Russo-Japanese War Russia's naval history was one of reasonable success. Admirals Apraxine and Grieg (of British origin), and the Prince of Nassau-Siegen gained some notable victories over the Swedes. Orlov, Spiridov, the British-born Elphinstone, Ushakov, and the two Senjavins, among others, were successful in the wars of the 18th and 19th centuries against the Turks. The Battle of Sinope in 1853, when the Black Sea Fleet under Admiral Nakhimov defeated the Turks,

was Russia's last naval victory. It led ultimately to the intervention of the British and French in the Crimean War. Other brilliant naval officers like Admirals Makarov, Essen, Eberhardt, and Kolchak died or were removed before they could change the situation.

Most of the Soviet admirals who came to the top during the revolution and whose only qualifications were political agitation and brutal killings were liquidated during the purge of 1937-38. Others like Oktjabrski and Tributz—commanders in chief in the Black Sea and Baltic in 1941—showed no leadership at all, fled from Sevastopol and Reval respectively, and later disappeared from the scene.

The importance of foreign officers, mostly English, French, and Dutch, and the American John Paul Jones in the Czarist navy in the 18th and 19th centuries must not be overestimated; it was then customary for all nations to hire foreign soldiers and sailors. Even England tried to recruit sailors from the Scandinavian countries during the Crimean War.

In the 19th and 20th centuries a high percentage of Czarist naval officers were of Finnish-Swedish and German-Baltic origin, the latter being the most able and reliable servants of the Emperor. The Soviet Navy is, on the contrary, almost entirely composed of "true" Russians.

Few Russian monarchs and political leaders have been sea-minded. The most gifted was Peter the Great, who re-created the navy in 1700 and took part as a naval officer in several battles. Katherine II, Paul I, Alexander III, and finally Nicholas II also showed some interest in naval affairs. Lenin, however, said that Soviet Russia would not need a navy, and for almost 10 years his doctrine was followed closely.

It was only shortly before the outbreak of World War II that Molotov demanded that Russia should build up her ocean sea-

power. Thereafter, England and Russia concluded a naval agreement and the Soviets built numerous ships, but the Voroshilov War Academy went on teaching: "The navy is the handmaid of the army." Hence in 1941-45 the ships were not used as they should have been.

After the war the buildup of an even stronger navy went on, and Marshal Zhukov declared that seapower would play a far more important role in the next war; but the Soviets have so far been unable to create and teach a "pure" naval doctrine. This inability to grasp the full meaning and all the possibilities of ocean seapower is one of the worst handicaps of the Soviet leaders. It will weigh against such able admirals as they may find in the future because of the predominance in the Soviet system of political considerations over purely military questions.

#### Tradition

It also is said that the *Russians have no naval tradition*. This is false, too. A nation does not need to win every battle to be proud of the deeds of its soldiers and sailors. Defeats often are more honorable than cheap victories. Some of the naval actions which the Russians commemorate as victories already have been mentioned. Individual deeds still stimulate the patriotic feelings of Russian sailors.

Such deeds include that of the French-born Captain Fremery, who blew himself up with his ship in 1737 as did Captain Sacken in 1788; the fight of the *Vesta* in 1877; those of the *Varjag* at Chemulpo and of the *Rurik* at Urusan in 1904, as well as the gunboat *Sivutich* which sank in 1915 under the close-range gunfire of two German battleships.

Even the Battle of Tsushima, the worst naval disaster not only of Russian, but of all modern history, still the main cause of the bad reputation of the Russian Navy witnessed some outstanding acts of bravery. The ships *Osslabjaja*, *Alexander III*, *Borodino*, *Admiral Ushakov*, *Vladimir*

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*Monomach*, *Svjetlana*, *Navarin*, *Dmitri Donskoi*, *Blestjachtchi*, *Besupretchny*, *Gromki*, and, above all, *Suvarov* fought in an outstanding manner until the bitter end; from several ships nobody was saved; and some of the commanding officers refused to leave the sinking ships.

But all this courage and stubbornness could not replace the lack of tactical skill; and even the sacrifice of over 4,800 Russian sailors could not wipe out the fact that Admiral Njebogatov surrendered with four ships to the Japanese; that the torpedo boat *Bjedovi* with the wounded and unconscious Admiral Rozhdestvenski on board fell into Japanese hands intact; and that the crew of the torpedo boat *Bodry* mutinied and fled to Shanghai. This was not the last surrender of Russian warships. In 1917 the Germans took the new destroyer *Grom*, and in 1919 the Bolshevik commander in chief of the Baltic Fleet surrendered his two destroyers to a British squadron without any fight.

Soviet naval tradition is, above all, based upon the action of the cruiser *Aurora* whose gunfire decided the flight of the Kerenski government in November 1917; she is now used as a floating museum at Leningrad. The *Aurora*, which fought in 1905 against Japan, in 1914-17 against Germany, in 1919 against the Allied intervention, and in 1941 once more against Germany, is probably the only major warship in the world that has survived three important wars.

Other Soviet naval traditions stem from the actions against the "Whites" and allies at Kronstadt, Murmansk, the Black Sea, the Volga, and the Caspian Sea. The Amur flotilla fought in 1920 against the Japanese, in 1929 against the Chinese, and in 1938-39 and 1945 once more against Japan. Some of the operations of Soviet motor torpedo boats and other coastal forces, as well as the sacrifices of Soviet submarines during World War II, also inspire Soviet writers.

Surprisingly enough, the only surface action which deserves mention is ignored completely. On 25 August 1942 in the Kara Sea the German pocket battleship *Sheer* sank the icebreaker freighter *Sibirjakov* which was armed with four 3-inch guns. The Soviet ship fought to the last and many of her survivors left swimming in the cold water refused even to be saved by the Germans.

### Construction

Some people said a few years ago that the Russians cannot build ships or, at least, no fine ships. In the meantime, the new Soviet cruisers, destroyers, and submarines have proved how wrong these "experts" were. Russia, like every other nation, has built some bad ships, such as Admiral Popov's circular batteries and the inferior battleships before World War I, or the cheap torpedo boats constructed under the First Five-Year Plan, the top-heavy leaders of the *Leningrad* class, and the submarines of the *P* type.

But there also have always been very outstanding ships, like the icebreakers, minelayers, and powerful destroyers built before 1917, and the submarines and destroyers launched prior to World War II. Four 32,000-ton battle cruisers built in 1916, and two 35,000-ton battleships on the stocks in 1941 were, however, never commissioned.

### Weapons

After the war of 1904-5 the Russians cast some excellent guns with outstanding ballistic performance and very long range. Their shooting was often pretty good but never good enough to obtain quick and decisive results. At Tsushima they had obtained a reasonable number of hits but their poor quality shells either did not explode or lacked adequate power and, as a result of this battle, the Russians, their faith gone, were never again very fond of using gunfire against ships!

Mines have been analyzed in a previous article, but it is worth mentioning that

Russian torpedoes (the first Whitehead torpedos were used in the war of 1877-78 against Turkey) were very unreliable, and the results obtained in all their wars, especially in 1904-5 and 1914-17, were very unsatisfactory. New types of torpedoes have been introduced since World War II, but torpedo manufacture is, above all, precision work, and in this the Russians have never excelled.

### Intelligence

Radio, tried out in 1895, was handled badly during the war with Japan, but much improved and cleverly handled during World War I. The Soviets, however, forgot what they had learned and Soviet ships in 1941-45 were very talkative. The coding was so primitive that the Germans were able to decipher almost all their messages as if written in plain language. The same loss of quality was observed in the field of naval intelligence.

The czar's navy had one of the best secret services of the world. Fred T. Jane remarked in 1903 that Russian officers often had secret foreign signal books and so on before these booklets were distributed to the officers of the navy concerned. One would expect that the Soviets, with the help of sympathizers in all navies, would have been even better informed, but World War II proved the contrary. The Soviets fell promptly into every trap the German Navy set, while German ships almost always got away. Soviet intelligence material about foreign navies is often surprisingly crude and inaccurate. Dictatorship is not a favorable breeding ground for good and reliable intelligence.

### The Sailors

From these examples and flashbacks we may conclude that the Russian sailor, although not very flexible and not always skillful, is a very brave fighter if his patriotic feelings—still very strong in an old-fashioned and simple manner—can be aroused. This the Soviets will not fail to do.

The Czarist government was unable, after the beginning of the 20th century, to appeal to the patriotic feelings of the Russian masses; nor was it willing to give them the necessary political freedom and economic security. As in all countries, labor was most affected by the new ideas, and as navies absorbed most of the skilled workers, the sailors were the spearheads of revolution. The Russian Navy suffered from revolts and mutinies in 1901, 1903, 1906, 1907, 1912, 1916, and 1917.

Surprisingly enough, the same sailors revolted against the Bolsheviks in 1921 at Kronshtadt, and heavy fighting occurred until they were driven into exile or to surrender. They probably wanted to protest against the stern discipline the Communists had reinstated; and they seemed genuinely disappointed with the results of "their" revolution of 1917.

During World War II, however, very few Soviet sailors deserted to the Germans and morale remained high. This was chiefly because of German mistakes in the handling of Russian prisoners and civilian population, and also because Soviet propaganda was busy, and the material situation of the lower grades had much improved compared with the Czarist navy.

### Factors

The outcome of another naval war may depend, among other factors, on the following points:

1. The "maritime sense" of the Soviet Government.
2. Talented Soviet admirals, able and willing to take initiative and risks.
3. The continuing belief of the lower ranks that it is a patriotic war and that the Bolshevik regime is again worth dying for.

The chances that the first two conditions will be fulfilled seem to be rather slim, but intelligent allied policy and clever propaganda could do much toward the awakening of the Russian people to the true state of affairs.

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## On Relative Strengths

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel A. I. Akram in the "Pakistan Army Journal" Volume 1, Number 4, 1958.

Let us take a possible example of relative strengths and assume for a moment that it is purely hypothetical. The example is as follows:

	Westland	Eastland
Divisions	9	2 2/3
Tanks	400	275
Armed		
Manpower	215,000	31,000
Air Force	larger	smaller

Now let any staff college in the world give its opinion as to which side in the above example is in a better position to take the offensive and, in the case of a battle, which side is likely to win. We may clarify further by saying that the ground for both sides is the same, neither side having any advantage over the other in this respect.

At first a staff college may hedge, hum and haw, and then drop such observations as "it all depends" and so forth. But if we corner the staff college and force it to give a decision, it will most certainly declare that the Westland alone is in a position to take the offensive and win the battle. And why not? The Westland has the superior force—its superiority, roughly, over the Eastland in terms of divisions, manpower, and armor respectively is in the ratios of  $3\frac{1}{2}$  to 1, 7 to 1, and 3 to 1.

But as luck would have it, the Westland did not win the battle or even take the offensive. On the contrary, the offensive was taken by the puny Eastland force which not only won the battle that ensued, but also utterly crushed the Westlanders, rendering them incapable of further organized resistance and inflicting, perhaps, the greatest defeat ever suffered by that worthy power during the war. In Westland the students of World War II are

sure to recognize the Italian Army under Marshal Graziani, and in Eastland the British and Indian forces under Field Marshal Wavell as they faced each other at the start of the Second Libyan Campaign.

But all this was wrong. Wavell had no business to take the offensive, least of all to score a dazzling victory that won the applause of the entire world and placed the mantle of glory on his broad shoulders. After all, the balance of relative strengths was clearly against him and he should have rightly kept to the defensive, praying earnestly for help and hoping that by some freak of fate he would be saved from being hurled into the Red Sea by the Italian "Goliath." Most of our military writers have insisted that the attacker must have a superiority of at least three to one over the defender; this is what the staff colleges normally teach. Some of them have even proposed a superiority of six to one.

However, Wavell did just the opposite in attacking a much stronger adversary. And the result of the campaign made nonsense of much of our teachings on relative strengths. Did the teachings go wrong particularly in this campaign? Or is there some fundamental defect in our present method of assessing relative strengths? A few more examples from military history will illustrate this point.

### Historical Examples

*Battle of Arbela—331 B. C.* Alexander the Great with about 50,000 men defeated Darius who had about 200,000 troops.

*Battle of Cannae—216 B. C.* Hannibal with a force of 32,000 foot and 10,000 mounted troops defeated the Roman Army of 65,000 infantry and 7,000 cavalry led by Aemilius Paulus and Varro.

*Battle of Pest—1241.* Sabutai with a Mongol army of 75,000 men defeated the Hungarian Bela who commanded a force of 100,000 European knights.

*Campaigns of Charles XII of Sweden—beginning of the 18th century.* Time and again this brilliant general routed the Russian forces which were from two to eight times the size of his own small army. When eventually he was defeated by Peter the Great at the Battle of Poltava in 1709, he had a force of 12,500 Swedes against Peter's army of 80,000. Many writers have expressed the view that had Charles not been incapacitated by a wound in his foot he would have won even the lost battle.

*Battle of Leuthen—1757.* Frederick the Great with a force of 36,000 men defeated the Austrian Army of 70,000 men under Prince Charles and Field Marshal Daun.

*Battle of Quebec—1759.* Wolfe with a force of 8,500 British troops defeated a French force of 10,000 to 14,000 troops (including Indians) under the command of Montcalm.

*Napoleon's Italian Campaign—1796-97.* In six separate battles Napoleon attacked larger forces of the Austrian Army than his own and defeated them.

*Battle of Tannenberg—1914.* Hindenburg with the German Eighth Army defeated the Russian First and Second Armies under Rennenkampf and Samsonov respectively.

*Manstein's counterstroke—February-March 1943.* In this action the Russians, immediately after Stalingrad, continued their winter offensive. They broke through the German front in the region of Kharkov and to the south of it, captured Kharkov from the Germans, and drove over 100 miles deep into the German-held territory. Manstein, suffering from an inferiority of one to eight over his theater of operations, launched his counterstroke against the southern flank of the Russian wedge. He destroyed the wedge, recaptured Khar-

kov, and brought the Russian offensive to a staggering halt.

In all these examples the weaker force won the battle and the stronger lost it. In most of these cases the victor did not meet just with an ordinary success but scored a brilliant victory, inflicting a crushing defeat on his adversary. In many cases the vanquished army ceased to exist.

### Source of Strength

It is now generally considered that relative strength is *not* a matter of size, numbers, or amount of equipment. It is a matter of firepower—the side which enjoys greater firepower being regarded the stronger of the two. It is by bringing fire on the enemy that we kill him or create the danger of death for him; it is death or the danger of death overcoming the enemy's courage and will that gives us victory.

But the armies which won these battles were weak even in firepower. Hence assessment of relative strengths on the basis of firepower alone also is incorrect. There must, therefore, be some other factors of strength which brought victories to the said armies—armies which on pure physical strength should have lost.

The fact is that a battle is not a contest of pure material strength and war is not a question of mathematics. This is fortunate, for if it were so the noble art of war would be degraded to the profession of the butcher and the best general would be the one who is capable of showing the most dogged persistence, guided by the cold, immutable laws of mathematics. It is not intended to belittle physical strength and size, but material strength is not everything and there are other sources of strength which in battle often play a greater part than the material strength.

In view of this, let us restudy in turn all those aspects which affect the relative strengths of combatants in the battles mentioned above.

*Second Libyan Campaign.* The British

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victory was due to Wavell's generalship—his skill, audacity, and brilliant handling of the fighting; the superior morale and training of the allied troops, mobility, and surprise. On the Italian side the weakness was due to their poor training, low fighting qualities, bad dispositions, and poor equipment.

*Battle of Arbela.* Alexander's victory was due to his tactical skill and presence of mind in dealing with Darius' enveloping movements; the superior discipline and training of the Macedonian phalanx against the unwieldiness of the Persian hordes.

*Battle of Cannae.* Hannibal's victory was due to his superior generalship—his brilliant trap, the better skill of the Numidian and Carthaginian horsemen, and the poor generalship of Varro who put too many troops in too little space.

*Battle of Pest.* The Mongols won this battle because of Sabutai's generalship—his remarkable strategic and tactical skill; the extreme toughness, better training, and organization of his army; and the greater mobility and skill of the Mongol horsemen.

*Campaigns of Charles XII.* The Swedes won their battles in their long, drawn out war with Russia on account of the tremendous personality, dash, and tactical skill of their general; and their own better training and organization against the ill-trained, ill-equipped, ill-organized, and ill-led Russian hordes.

*Battle of Leuthen.* Prussia scored a victory because of the generalship of Frederick the Great—his masterly planning and conduct of the oblique order attack and his concentration of superior strength against the Austrian left wing; the training and battle procedure of his army; and the bold handling of the Prussian cavalry by Zieten and Driesen.

*Battle of Quebec.* The causes of the British victory lay in the daring tactics of Wolfe—the unusual design of his ma-

neuver in scaling the heights of Abraham; surprise and offensiveness; the better organization, training, and discipline of the British regiments and their dogged fighting; and the achievement of local superiority by Wolfe on the plain of Abraham.

*Napoleon's Italian Campaigns.* Napoleon won his battles in quick succession because of his personality and generalship; his concentration of superior forces in turn against parts of opposing force; the advantage of his position on interior lines, surprise, and the mobility of his army.

*Battle of Tannenberg.* This famous German victory was due to Ludendorff's brilliant plan of the battle on interior lines; the superior training and organization of the German Army; the poor generalship of Rennenkampf and Samsonov, their lack of mutual cooperation, and Rennenkampf's lack of initiative.

*Manstein's counterstroke.* Manstein's success was due to his own masterly conception and handling of the counterstroke; the superior training and skill of the German divisions; surprise; and the long and exposed flanks of the Russian salient.

The causes of victory in all these battles indicate that there are many factors which influence the outcome of a battle, each of which is a source of strength. It would be wrong to say that any one of these sources would by itself place the crown of victory on our head, as each factor plays only a part in giving power and effectiveness to a force. This much, however, is clear, that the material strength is not the only thing that counts, and if it did, then those who actually won these battles should have lost them. In reality, an army derives its strength from all these sources.

#### Effect of Time and Space

A general preponderance of strength is of little use unless we can achieve concentration in time and space, and a general inferiority in strength need not worry us if we can achieve this concentration.

The principle of concentration is that we should have the required strength *at the decisive place and at the decisive time.*

The entire problem is admirably expressed by Napoleon:

*Strategy consists in having, in spite of an army of inferior strength, a larger force than the enemy at the point attacked, or at the point which the opponent attacks.*

Unless the conditions of time and space are favorable, we cannot use material superiority over the enemy. This point is often not appreciated when we think of the superiority of one side over another in material strength. If Varro had understood the effect of time and space on force, he would not have flung the bulk of his legions against Hannibal's center, where, having got into the trap, they changed from an organized military force into a seething mass of helpless humanity.

Varro would have been wiser to deploy only half of his force which, even when trapped, would have had sufficient space to maneuver and use its weapons, and would thus have proved more effective than a larger force.

We must then keep time and space in mind when judging our relative strengths. We must make time and space our allies. If the conditions are favorable, concentrate a superior strength against a smaller portion of the enemy's force by correct deployment in time and space.

### Morale

The importance of morale and the power it gives to an armed force have now been established beyond doubt. It has become a principle of war. We are always thinking about morale; we have reports and returns dealing with morale; when a superior visits a subordinate he asks about the state of morale; commanders and staff officers constantly worry about morale. Yet when it comes to the assessment of relative strengths, we forget all about

morale and work on a required material superiority of three to one for the attacker. We forget Napoleon's famous words: "The moral is to the physical as three to one."

It must be borne in mind that a battle is not so much a clash of arms as a clash of wills. Real defeat occurs *in the mind.* Unless the vanquished accepts defeat and gives up his aim, he cannot really be regarded as defeated. A battle is a contest of moral strength.

We all know the old saying: "War is the domain of moral force." Time and again a smaller force which enjoyed higher morale defeated a larger adversary. Material strength is impotent if the will to fight is absent. This was well brought out in the Second Libyan Campaign in which a major factor affecting Wavell's success was the moral superiority of the British and the Indian troops over the Italians. If the Italian morale had been good, and if they had fought with courage and defended their positions with determination and doggedness instead of surrendering in tens of thousands, Wavell would not only have had *no* success but would have long rued the day on which he decided to launch his offensive.

The power of morale is admirably expressed by Jomini: "No system of tactics can lead to victory when the morale of an army is bad."

### Mobility

As stated earlier, even in material strength what matters is not the size of a force but the amount of firepower which that force can produce. However, the possession of the ability to produce firepower is of little use without the ability to bring that firepower to bear upon the decisive place and time. It is *mobility* that enables a force to employ its firepower where it is most required. An armored force is mainly a combination of firepower and mobility (plus a certain amount of armored protection). When such a force carries out an outflanking movement to

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strike at the rear of the enemy, it is doing nothing more than using its mobility to transport firepower to a place where a decision can be obtained. Hence mobility is an element of force.

Mobility has been the cause of many victories on the battlefield. Therefore, Marshal Foch was correct to define force as *mass multiplied by impulsion*. Mass by itself, without impulsion or the capacity for movement, wields little power in battle.

There is, however, a purely *defensive* aspect of mobility. This aspect is that a force protects itself by its own movement. This is so because we cannot attack a force while it is moving. Before we can attack it, we have to *fix* it; if there is no fixing, there is no attack!

This was the essence of the strategy of Fabius against Hannibal. It is worth noting that while Hannibal thrashed every other Roman commander who dared to face him in Italy, he could never thrash Fabius because the latter would never let Hannibal fix him. He would always pull back.

From the above cited example of Fabius the readers should not get an impression that mobility has a protective influence only, in the sense that it enables us to run away. It is not so. Mobility can protect us even in a forward offensive movement. This point is well-illustrated in one of Manstein's operations in Russia in 1941. When the invasion of Russia began Manstein was commanding the 56th Panzer Corps in Army Group North. After the initial breakthrough Manstein advanced 200 miles in four days. On 26 June he reached Daugavpils—80 miles ahead of the German formations on his flanks—and wanted to push on still farther. He felt that, given a free hand, he could capture Leningrad—nearly 300 miles away.

To his bitter disappointment, he was ordered to halt and to go to the defensive to safeguard his bridgehead across the

River Dvina. In this defensive position he had a hard time beating off Russian attacks until formations on his flanks had caught up. We see in this instance that Manstein had long and open flanks and had formed a deep salient, losing all support from his flanks. But he felt perfectly safe as long as he was *in movement*. The moment he was halted his troubles began. If Manstein thought so, then one would require a lot of courage to disagree with the point that mobility by itself, as purely a defensive measure, provides security and reduces the enemy's advantage of superior material strength.

### Offensive

According to Clausewitz, defense is the stronger form of war. Surely, one would not like to pick a quarrel with a man like Clausewitz. But even that great military thinker agreed that defense was negative—unproductive of great decisions, and he did not dispute that offense, although the weaker form of war, had certain clear advantages over defense, such as maintenance of morale, impetus, and initiative, which would give victory to the attacker provided the other combinations were right.

In fact, the offensive is not just an operation of war; it is an attitude of mind. Even the defender can take an offensive attitude which gives him greater moral strength. An army which is imbued with the offensive spirit, and is ever ready for a battle with the aim of bringing about a complete destruction of the enemy, will always command a moral advantage over its adversary.

If Hindenburg at the Battle of Tannenberg had taken a defensive attitude and waited for the armies of Rennenkampf and Samsonov to develop a coordinated attack against his Eighth Army, he would have been doomed to defeat. But he, while holding off Rennenkampf with a weaker force, concentrated the bulk of his army

against Samsonov, and in doing so he did not adopt a defensive attitude.

Taking the initiative, he attacked the flanks of Samsonov's army, forcing it into a Cannae-like trap, cleverly planned in the center. Three of Samsonov's corps were swallowed up like Varro's legions, as if by an earthquake. Without this offensive attitude and the consequent offensive maneuvers, the outcome of the Battle of Tannenberg would have been very different.

In the Seven Years' War it was the offensiveness of Frederick the Great which saved Prussia from extinction at the hands of the three most powerful states of Europe—each individually stronger than Prussia. Whenever Frederick fought, he fought offensively—augmenting his material strength with the inherent power of the offensive attitude. According to Du Picq: "He will win who has the resolution to advance."

To act upon the principle of offensiveness, there is no need for us to wait until we get the opportunity to launch a major offensive. As already stated, the offensive is a state of mind which enhances our strength, and so long as every element of our army is imbued with this spirit, we can regard ourselves as being stronger than what is warranted by the table of relative strengths.

#### Ground and Position

During the days of the Indian northwest frontier operations, time and again, an entire brigade group, equipped with whatever weapons it could use in that country, including artillery and machine-guns, was held up by a handful of tribesmen armed with nothing more than locally made rifles. Why was this so? Relative strengths gave the regular army a superiority of 100 to one, and yet the *lashkar* could not be beaten off for days. Sometimes the tribesmen inflicted casualties on the army far greater in number than their own strength! Besides one or two other

factors, this was due to the effect of ground.

The high peaks, the narrow passes, the difficult approaches, and the stiff climb were the allies of the tribesmen, making it extremely difficult for the regular troops to come to grips with their foes. If the same *lashkar* of 50-odd tribesmen had taken up a position in the desert, a platoon of infantry with its own 2-inch mortar support would have polished it off in a few minutes.

Another aspect of ground and position is the line of operation which can, by itself, add strength or weakness to a force and can deeply influence the outcome of a battle or a campaign. It is generally accepted that if a smaller force is facing a larger force it is better for the smaller one to be on the interior, rather than the exterior lines, provided it has the capacity to operate offensively and is not forced to adopt a static defense. This rule will hold good despite the increased mobility of the modern armies and further improvements in the modes of transportation.

The reason is that, although a force on exterior lines can concentrate with speed at the point attacked by its adversary, there is still a relative difference in time and movement which is related to distance in space.

Napoleon's Italian Campaign, the Battle of Tannenberg, and the twin battles of Kasserine Pass and Medenine fought by Rommel in February and March of 1943 may be cited as good examples of the advantageous use of the interior lines.

Ground and position are a source of strength that must be kept in mind constantly. When we find ourselves materially weaker than our opponents, we must study the effect of ground and position on the impending battle. We may often find that due to this factor, we are at par with or even stronger than our enemy. It is never correct to deduce a relative superiority of one side over the other by a simple

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assessment of material strengths, without considering how these strengths are likely to be influenced by the position and the ground held by the combatants.

### Generalship

We now come to what is perhaps the greatest source of strength: *generalship*. This is a factor of supreme importance—so important, in fact, that Foch has declared: *Great results in war are due to the commander . . . without a commander no battle and no victory is possible.*

On generalship Napoleon said:

*The personality of the general is indispensable; he is the head, he is the all, of an army. The Gauls were not conquered by the Roman Legions, but by Caesar. It was not before the Carthaginian soldiers that Rome was made to tremble, but before Hannibal. It was not the Macedonian phalanx which penetrated into India, but Alexander. It was not the French Army which reached the Weser and the Inn, it was Turenne. Prussia was not defended for seven years against the three most formidable European powers by the Prussian soldiers, but by Frederick the Great.*

To this one could well add: It was not the Revolutionary Army of France which shattered the proud empires and the kingdoms of Continental Europe and made England gasp for breath, it was Napoleon!

Keen readers may have noticed a contradiction in the examples quoted earlier from the last war. This relates to Manstein's operations. When Manstein himself made his long salient with the 56th Panzer Corps he was safe; but when the Russians formed their salient (described under Manstein's counterstroke) they met with disaster. There were many factors such as mobility, training, and skill which made the difference between the two operations. However, the greatest reason for the difference lay in *generalship*.

If in 1941 there had been a Russian military giant facing Von Leeb's Army Group,

he might have taught Manstein a bitter lesson for poking his nose so forward, in spite of his mobility. But there was no such military giant then on the Russian side. In February 1943, when Vasilevsky broke through the German front and established his salient, unfortunately for him, he had Manstein against him who sent him reeling back without a nose.

Hence we accept the power of generalship. In modern war generalship at higher levels may not be as personal as before; the art of command might have grown more impersonal, more complex; leadership may now become corporate rather than individual. But the value of generalship remains immense. A smaller force led by a brilliant general may be taken as stronger than the table of relative strengths would indicate.

### Effect of Miscellaneous Factors

So far only a few of the sources of strength have been considered. Other notable sources are training, order and discipline, and surprise. Except for surprise, the others have been telling factors in battles fought over the last 200 years between European forces and African hordes or Asian troops—the latter being invariably poorly equipped, poorly trained, and poorly disciplined.

Surprise, too, is a factor which has often decided the fate of a battle in favor of the weaker side. It gives a moral advantage out of all proportion to the size of force involved in achieving it. This hardly needs the support of examples from military history. As a factor, however, it is difficult to assess it in relative strengths as both sides are out to achieve it and it is usually difficult to say which side will succeed in doing so. The only time we can count on it is when we find ourselves in a position to surprise our opponents in a startling manner; we can then regard ourselves stronger than what would appear from a comparison of relative strengths.

### Conclusion

It should be clear from the foregoing that a comparison of pure material strength is no index to the true relative value of opposing forces in a combat. The examples given above from history should leave no doubt in this respect. Our present system of assessing the relative strengths certainly is faulty and needs an overhaul. But what system are we to follow? Should we add further headings to our table of assessment? For instance, shall we, after considering material strengths, add: morale—two points to one; generalship—three points to one; mobility—one point to one? This obviously would be absurd, because such factors are not subject to mathematical computation. War is not a system of mathematics, as force is not a matter of material strength. If it had been so, then in the history of war there would not have been such personalities as Sabutai, Napoleon, and Lee.

What is required is that we should not be unduly influenced by the physical size of an army. In other words, we should not expect the material superiority to win by itself and material inferiority to lose as a

matter of course. When we assess relative strengths, we should consider the effect of other factors on strength. *Is our generalship superior? Does our mobility give us more power? Are we in a position to surprise the enemy? What of the moral factor? Which side is favored by ground and position? Which side is better trained, better organized, and better disciplined?*

Having considered all these sources of strength, we should decide which side is truly stronger, whether our aim is attainable or not, and what plan of operations should be adopted.

Young officers, while learning the art and science of war, must not be overawed by the large armed forces of possible adversaries, and senior officers should not overemphasize the value of material strength. We already have given it too much emphasis.

A battle is essentially a clash of wills, success going to the will which is stronger; defeat occurs in the mind rather than in the body of an army; without leadership, skill, courage, training, and discipline any preponderance of weapons and equipment is valueless.

## Civil Defense in the Nuclear Age

Digested by the MILITARY REVIEW from an article by Captain R. Eager in "An Cosantóir" (Ireland) September 1958.

WHEN death exploded on Nagasaki and Hiroshima, the mushroom of smoke and radiation that slowly ascended spread throughout the world a feeling of apprehension that far exceeded the fear of war gases and chemical warfare that was the heritage of World War I. In the latter case, a partial answer had been found prior to the cessation of hostilities, but defense against the atom bomb's devastating blast and its insidious sister, radiation, seemed impossible.

However, at least to a section of the

world population, there was a reassuring feature—the virtual monopoly of nuclear weapons by the United States. This appeared to represent a powerful insurance against another major war and the inevitable complacency that followed in official circles gave rise to an almost leisurely approach in these quarters to the question of civil defense.

Such a feeling was dispersed rapidly, however, with the development of nuclear weapons behind the Iron Curtain and the reduction of the gap between the opposing

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blocs in the quantity of such weapons. Now a stalemate exists in which the striking power of both sides is matched. War must strike suddenly and without warning; a formal declaration of a state of war can result only in the loss of surprise and the opportunity for the opposing forces to retaliate—and if war comes, it must be assumed that intensive use will be made of atomic and even chemical weapons.

### The Questions

In these circumstances the questions being asked are whether the civilian population can be protected against nuclear attack by the use of shelters, and if such shelters would have any functional value in the event of a surprise attack. While United States tests of nuclear weapons no doubt have provided some of the answers to the first question, it is only during actual hostilities that the entire picture can come into focus.

An attempt to study the position seriously was made recently by the Research and Development Corporation in California, and the problem was approached under three headings, namely: the possibility of protecting civilians against nuclear attack by the use of shelters; the chances of surviving long-term radiation from fallout when they finally leave these shelters; and the possibility of death by starvation.

The report submitted the opinion that shelters against blast could be provided but that this would involve the erection of deep, underground shelters which would cost (for four million New Yorkers) between 20 and 28 million dollars.

Protection against fallout could be procured by adapting existing basements in large buildings and by constructing light shelters at comparatively small cost. The effects of a radioactive world on the population—when they finally would emerge from the shelters—can only be surmised, but it is claimed that evidence exists that

the long-term radiation problems would be a lesser threat to the survival of the population than the immediate problem of protecting people from a nuclear war. The problem of starvation would depend entirely on the number of bombs dropped and their location in relation to the agricultural portion of the country.

### Warning Time

The success of any shelters as a defense against nuclear or, indeed, any weapons must depend on how much warning of attack would be received. A period of tension, such as has occurred in the Quemoy area, or a decision by the Western Powers to end such tension by striking first, would permit some days' warning and make possible a reasonable time for evacuation and the disposal of the civilian population.

A surprise attack launched against military or "retaliatory" objectives would give somewhat shorter warning time. Finally, a surprise attack, which would include centers of population in the initial targets, would allow warning to such targets that could be measured only in minutes.

Civilian populations, uneducated to the need for orderly cooperation with civil defense workers, inevitably would cause indescribable chaos in the event of a surprise attack. Even with ample warning the task of civil defense authorities would be formidable. Nevertheless, it has been estimated that without civil defense measures, more than 50 percent of the population of a heavily attacked city would be wiped out. This could be reduced to 40 percent by the availability of fallout shelters, where only a brief warning would be possible; to 20 percent with advance warning measured in hours; and to anything between two and 15 percent where the warning could be measured in days.

While such statistics as these must be hypothetical, they are useful insofar as they give some indication of the value of

shelters for the civilian population. Most of the major nations have taken the view that civil defense is essential and, in greater or lesser degree, have initiated steps to translate their convictions into action.

The Soviet Union, according to a recent report, has constructed "cellar" shelters for a substantial proportion of the population and has embarked on a program for the construction of hydrogen bomb shelters. There are about 22 million civil defense workers in the USSR (almost 10 percent of the population) headed by a corps of full-time personnel. In addition, it is expected that a further five million men and women will be trained annually.

Such a strong and expanding civil defense program indicates that the Soviet Government is adopting a realistic approach to the implications of nuclear warfare and also that they are extremely conscious of the fact that future warfare will be fought on a nuclear level.

#### Western Picture

In the West the picture is not so good. In October 1954 the then Deputy Supreme Commander, Allied Powers Europe (Field Marshal Montgomery) pointed out that no sound civil defense organization existed in the territory of any NATO nation.

Even today the United States has virtually no adequate hydrogen bomb shelters and only about one million civil defense workers. The United States House of Representatives Military Subcommittee has given as its opinion that millions of Americans would be killed now in an atom bomb raid and stated that the power of the United States to retaliate was being undermined by lack of civil defense preparedness. It called for a 25 to 30 billion-dollar expenditure for the construction of shelters, to be spread over the next five or six years.

The United States authorities have, apparently, been placing extraordinary

confidence in the new developments in radar equipment which has detection ranges of more than 3,500 miles and in the DEW (Distant Early Warning) Line—a 3,000-mile radar chain that stretches across the Arctic fringe of the North American Continent. In the 1957-58 budget only 1,000 million dollars were allocated for Federal Civil Defense Administration.

The strength of civil defense workers (all volunteers) in Great Britain numbers only 500,000 and, while regional committees have been set up and exercises planned in conjunction with the armed forces, steps have not been taken to provide adequate shelters on a large scale. Nor is the number of civil defense workers sufficient to cope with an "all-out" attack on the major cities where the citizens have not been rehearsed for such an eventuality.

Among the other NATO powers the Netherlands has announced conscription for certain civil defense services. At present, the Civil Defense Corps consists of 160,000 volunteers, but this is not considered a sufficient number and, in January 1959, it was proposed to call up 60,000 men between the ages of 24 and 60 for a period of 60 days' training in rescue and ambulance work and fire-fighting duties. The erection of anti-hydrogen bomb shelters on a large scale does not appear to have been undertaken.

#### The Neutrals

Of the neutrals, Sweden, Switzerland, and Finland are probably the most conscious of the threat to civilian populations and each has an elaborate civil defense system. Sweden, by making use of her geological assets, probably has the most advanced civil defense system in the world. The Civil Defense Corps numbers 750,000, and plans have been perfected to evacuate 50 percent of the total population from over 100 cities and towns. Large air raid shelters have been constructed in mountains and cliffs and these are claimed to be proof against both blast wave and

radiation extension advanced.

In Switzerland, in the last few years, the government has organized a civil defense unit up a Swiss mountain more than 2,000 feet above the sea level.

The Swiss government has estimated that in the event of a nuclear attack, the state of emergency would last for several months.

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radiation. Plans for the improvement and extension of these shelters are well-advanced.

In Switzerland, civil defense is compulsory for all males between 15 and 65 years, and women between 15 and 60 years may volunteer. Industrial establishments with 50 or more employees must organize civil defense teams, and all communities of 1,000 people or more must set up a civil defense administration. The Swiss armaments program provides more than 20 million francs (or 3.5 percent of the budget) for civil defense.

The Finnish Civil Defense Organization was established as far back as 1927. Service is voluntary, but even in peacetime the state may order compulsory service of men and women between 16 and 60

years. Since 1954 the incorporation of adequate air raid shelters in certain buildings has been compulsory, and, in 1956, the government directed that larger towns and communities would be responsible for formulating plans for the evacuation of between 40 and 60 percent of the population, for warning systems, and for the construction of air raid shelters.

### A Defensive Weapon

In the nuclear age civil defense has assumed the proportions of a weapon—a defensive weapon, no doubt—but one on which a strategy of deterrence can be based. It would be unrealistic for any of the Western Powers to place reliance entirely on the stockpiling of offensive weapons without a concurrent safeguarding of the homefront.

## Ground Fortifications--Today?

Translated and digested by the MILITARY REVIEW from a copyrighted article by Lieutenant General Kurt Dittmar, Retired, in "Allgemeine Schweizerische Militärzeitschrift" (Switzerland) Nr. 1, January 1958.

TODAY, the subject of ground fortifications in the classical sense of protective constructions combined with adequately strong obstacles prepared in peacetime may be embarrassing if raised outside of historical context. For thousands of years such emplacements have been used in different forms but always following the same principles. Now they definitely seem to be an item of the past. It appears, and there are reasons for this impression, that the chapter of history which dealt with the walls of Troy and Mycenae, the castles and walled towns of the Middle Ages, and the ring fortresses of recent times has been closed.

Just at the time when ground fortifications reached the height of their development and value, the events of World War II demonstrated their ineffective-

ness, a factor which very likely contributed most to their present low rating. None of the long "lines" and "walls" which required tremendous investments and technical skill fulfilled the expectations. This is true for the French Maginot Line in 1940 as well as for the Greek Metaxas Line in the following year. It also is true for the German Atlantic Wall, although its coastal site should have assured a higher degree of protection.

After the war many were inclined to condemn ground fortifications completely, but now the time has come to question this condemnation.

### Weaknesses

A revision of this opinion cannot be based solely on the facts that while these fortifications demonstrated an amazingly

high defensive strength whenever the enemy attacked them head-on, in all instances there were extraordinary circumstances causing them to succumb relatively quickly. The Maginot Line and Metaxas Line were outflanked and then rolled up. The Atlantic Wall, offering no bypass possibilities, was broken through because the Allies—with their immense material superiority—could direct their landing without reference to port facilities, and could attack toward a sector where an attack was least expected.

These mammoth fortifications did not succumb to unfortunate accidental occurrences. Rather, the causes of their fall were constitutional.

Theoretically, it may be quite possible to build a fortification line which can be neither outflanked nor has weak sectors; practically, however, it is not so easy. The financial expenditures and the strain on economic resources caused by such a gigantic undertaking are simply too great to permit it to be carried out with perfection, at least not without detriment to other vital state requirements. There will always have to be a compromise between what is needed and what is feasible.

Still other particular qualities of permanent fortifications as developed up until World War II contributed to their failure. Their linear arrangement lacked distribution in depth. Thus each breach meant disaster for the adjoining parts, and sometimes even for the entire system. The vertical outflanking by airborne troops, as was the case in 1940 and on a larger scale in 1944, was especially effective.

In many cases the fortresses succumbed directly to modern means of attack. The outlooks and cupolas dominating the defended terrain fell under the direct fire of armored cars and self-propelled assault guns. Bombing from the air and heavy artillery fire, even if they were not destructive, nevertheless hampered defensive fire activity because of craters they made

and dirt they displaced. Smokescreening isolated the fortresses. As in many other instances, flexibility and mobility and the resulting fast concentration of fighting power proved to be far superior to rigid immobility.

Thus the present low rating of permanent fortifications inevitably appears to be justified. Never in the more recent history of war were fortifications valued higher than at the beginning of World War II. And yet the result was nothing but a tremendous misinvestment of energy and material. But does this conclusion suffice not only to discredit the undoubtedly exaggerated attempts to seal extended borders, but also to question the function of the ground fortifications as border protection?

### Some Succeeded

Because of the many failures of the lines and walls and their badly damaged reputation of impregnability, many people often overlook the fact that during World War II there also were fortifications which fulfilled expectations. This point of view can be applied even if they were finally assaulted and evacuated. The purpose of the fortifications can hardly be in holding out until the end of the war, as desirable as this might be.

In the first place, fortifications have other purposes than of defense alone. The possession of these places often creates favorable conditions in support of our own operations, and limits and renders more difficult the operations of the enemy. A fortification which fulfills this purpose has justified the investments made in its construction, and can be "written off" in case it is taken by the enemy, just as any other machine that lasts exactly as long as calculated can be written off without loss.

From this point of view, fortresses like Sevastopol and Tobruk fulfilled their task in the last World War. This was in de-

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fiance of a theory based on experiences in World War I that ring fortifications were of the past and that the future belonged to the linear fortifications developed from the trench warfare of World War I. The fact that the Russians were not able to make adequate operational use of their strong beachhead at Sevastopol in 1941-42 was not the fault of the fortification itself.

The argument arises that both Sevastopol and Tobruk were fortifications which could not be completely surrounded because of their coastal site. This is correct only to a certain point. A site on the seashore does prohibit a complete encirclement by the enemy, but the same is true of a site on a large river that has to be defended. The fortified place assumes the function of a beachhead—a role which Napoleon and Moltke considered to be most important, and which, as Moltke said, alone justifies a large investment to protect such "points" with permanent fortifications.

#### The Future

The undisputed failure of the lines and walls does not necessarily imply that fortifications which have been planned in peacetime and follow the operational points of view of Moltke and Napoleon will not still be useful in the future. However, we must leave unanswered many questions about the "how" of the fortifications, particularly about the extent of the investments; but questions about the "whether," can be countered easily by another question. Does it really make sense to leave a port or a beachhead of probable high operational importance without any fortification protection, so that it can be taken easily by the enemy's assault?

It would be difficult to convince any nation that to seek survival through the creation of a redoubt based on natural strongholds is outmoded and oldfashioned. Such a central fortification is still mean-

ingful today, provided its extent is large enough to preclude a concentration of the enemy's artillery and aerial fires, but without being too large for the available defense forces.

In order to realize the highest possible defensive potential, fortifications must keep up with all developments of means and methods of attack. Therefore, they will never be quite finished. But it would be utterly foolish to believe that every point in an area can be turned into a fortified place of the same strength as points of unquestionable importance. To attempt this would, as in the case of lines and walls, bring on the danger of tremendous misinvestments.

That there can be graduated ground fortifications is no inconsistency. This is proved by the historical fact that the degree of improvement of fortifications always has been in accord with their importance and the extent of the threat to them. But even more conclusive is the essential role which improvised fortifications, built with regard to the operational needs in a temporary situation, had in the history of World War II.

#### Improvisation

The course of the winter campaign of 1941-42 on the Russian front gives some striking examples of the endurance of improvised fortifications—at that time called "fortified places." There were wide gaps, in some areas so large that entire armies would be needed to fill them. Russian shock troops could have made their way westward free and unhampered if a number of little-improved, but tenaciously defended, localities had not served as strongpoints of the German defense. These localities were road junctions in the meager road network of a snowed-in country. They took the momentum away from the Russian offensives, and slowed them down until the German command could take appropriate countermeasures. Thus names

of towns, insignificant in themselves, like Welish, Demidov, and Kholm justly made history in World War II.

In essence these were purely field fortifications which added to the power of the defenders. By using available materials and existing structures, a strong type of fortification gradually was developed. But it is this comparatively low passive strength which also makes these fortified places interesting today. With a small investment, a high degree of defensive strength and operational power was obtained which probably exceeded expectations.

The German command's decision to support the defense by fortified places was based on an accurate appreciation of the entire situation, not only pertaining to the enemy, but also in evaluating the relief of these temporary fortifications within a reasonable period of time as required by their limited defensive strength. Without taking such decisive factors into account, Hitler, in the later war years, declared many points of prestige value only and without any real operational importance to be a "fortified place," a fact which contributed strongly to discredit these improvised constructions. Nevertheless, many temporary "strong points" were of real importance in the conduct of the war. An example is the importance assumed by the road junction of Bastogne in American hands during the German Ardennes offensive in December 1944.

It should be noted that the high esteem placed on field fortifications has remained almost undiminished through all the fundamental changes in strategy and tactics. Until the last days of World War II, reinforcements of the ground with available means in the field were a natural phenomenon, concomitant of every defensive or every delay of an offensive. This also was the case in the Korean campaign.

### Prepared Fortifications

Considering the proven value of improvised fortifications, the essential features of the field works would have to be transferred to the prepared fortification as much as possible. The improvised work has one unquestionable advantage—it originates immediately from the operations. The time and place of its use are in accord with an actual need, thus diminishing the danger of misdirection of means and forces.

The defensive power of individual constructions is small, of course, but this turns out to be another advantage, since the small dimensions of dugouts and fortified bunker systems allow good camouflage and wide distribution in depth—in opposition to the strong concentrations of fortified bunker systems in the hitherto existing permanent fortifications. It is a cogent conclusion that a future ground fortification will have no other purpose than to provide more defensive strength for the most important individual fortresses by utilizing the principles of the field fortification.

By this means the concept of a "prepared field fortification" is materialized—*prepared* insofar as the possibilities of improvements are carefully taken into account without abandoning the adaptability of the field fortification to the operations.

The same procedure would apply as in the case of the "fortified places" on the Russian front in World War II. The starting point and bases in this area were mere field constructions with stronger bunkers and dugouts being built later. Thus an intermediate state was arrived at in which the works could no longer be considered improvised field fortifications, although the system was still the same. Yet they were not permanent fortifications, in the traditional sense. Compared with the latter, the improved field fortifications certainly were no more than

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improvisations, but they took major advantage of the individual features of each position.

### Two Conditions

If a place, or a sector of an area, is to achieve a military value exceeding that of merely improvised improvements, two preliminary conditions have to be fulfilled.

First, the troops to defend this place or sector must be completely familiar with the area involved. So far as national territory is concerned, all places which will be of verifiable defensive importance should be reconnoitered, the results of the reconnaissance recorded, and, eventually, the individual fortified bunker systems surveyed and planned in the field. Certainly, these tasks require a huge organization but one that will pay off.

In order to fulfill the second preliminary condition—the quick construction of defensive improvements, when required—everything necessary will have to be ready: labor forces, building materials, and transportation. This does not imply a storage of these items on the spot, because this would seriously hamper the development of flexible defensive plans. It will be better to store the required materials in such a way that the command is most free to decide their use. Improving and multiplying the road connections and establishing a preliminary communication system will be more efficient than dumping materials close to the place where they presumably will be used.

Modern construction machinery will take a special place among the devices made ready in advance. With these machines, modern technical developments enter the field of fortification construction. The opportunity appears to make the fortifications independent of lengthy construction periods which, up to now, were considered necessary for works of higher defensive strength than those of improvised field construction.

### Advance Preparation

During the last war the Germans dealt extensively with the problem of how to combine speed of construction with increased defensive power of more or less improvised fortifications. One of the remarkable results of these deliberations and practical tests, carried out under enemy action, was the so-called Tobruk dugout. It was a small dugout with a circular opening at the top for machineguns, bazookas, or trench mortars. The construction, which was flush with the surface of the ground with a small covered opening in the ceiling and a small escape hatch, was well-camouflaged. Due to the strong bracing of the entire structure, the relative thinness of wall and ceiling—made of 16 inches of reinforced concrete—proved to be sufficiently resistant even against shells of medium caliber exploding in the immediate area.

A well-organized production plan made it possible to fill the prospective battlefield with these small structures within a short time, usually a matter of a few days. Practically, the limits of feasibility were more dependent on shortages of building materials, transportation, and labor than on any other factors. To take preparatory measures in these respects in peacetime would apply a characteristic feature of the permanent ground fortification to the field fortification without hampering the final decisions of the command.

A rapid reinforcement of such fortification will be required whenever, in the ebb and flow of mobile warfare, the clear necessity for holding a particular place arises. However, there will not be such a pressure for improvisation in all cases. On the basis of that same analysis of operational probabilities on which the preliminary reconnaissance is to be based, sectors and places will be selected for which a higher degree of defense strength is at least desirable. Their value for the

accomplishment of our own operations, unlike the value of the points of first priority, may not be completely clearcut. However, their fortification improvements cannot be limited simply to preparatory measures. In such a case, peacetime improvements in a less extensive form could be justified, providing a strong skeleton in the form of permanent semifinished structures to start with, and leaving the final shaping to the field fortification.

The first stage of improvement would provide a strong "outer plating" to guard the place or sector from surprise actions. It also would help to secure the time needed for the second stage of improvement, the completion of the structures by improvisation, should this become necessary.

It might appear that these skeleton fortifications would require an investment that almost matches the one needed by the refuted long-extended linear fortification systems. However, only relatively simple, largely standardized structures are needed without the extensive surface adjustments previously considered necessary. Constructions based on natural obstacles for protection against armored car attacks often can be combined with road constructions or improvements of river channels, and reinforced basements may be suitable for passive air defense purposes in many cases.

Likewise, there is little reason to fear that the proposed skeleton fortifications by their mere presence will motivate the command to use them when the operational situation does not require it.

These fortified places, chosen and prepared as outlined, should not be selected on a basis of prestige value. Mountain ranges or large wooded areas are better strongholds or bases than any city, and can function as obstacles just as much as the latter. Furthermore, the right or wrong use of fortified places has been and will always be a matter of education

and training of commanders. The only essential principle is that fortifications of any type derive their value and importance from the support they lend to our own operations. To hold them for honor's sake is of secondary importance.

### Nuclear Weapons

Every treatise about the present and future possibilities of a particular means for waging war would be incomplete without considering the existence and the use of nuclear weapons. It may be suggested that the value of fortifications must be at least very questionable because of their rigid immobility at a time when everything has to rely upon flexibility and movement.

In contradiction to this, reports of nuclear tests show that the passive protection of men, arms, and supplies has been dealt with extensively. The topic of field fortifications frequently is referred to in this regard, at least marginally.

This high valuation of technical protective measures seems to express a definite conception. Although continuous movement is considered to be the principal basis for operation and battle today, one must also realize the limits which are inherent to such a method. It is significant that to maintain the desired flexibility, fortified bases and protected storage spaces will have the same importance for the ground forces as they always have had for naval and air forces.

Thus it seems conceivable that ground fortifications in the age of nuclear weapons will, in essence, consist of a deeply distributed system of fortified places, the construction of which will protect against the menace of possible nuclear bombing and provide defense against armored formations.

But only further construction would attain a strength which would guarantee these fortified places being able to hold out for a prolonged period of time. The skeleton constructions, which are the

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foundation of the improvements, should not anticipate the final decision as to whether and how the individual fortified place should be defended.

Such a system of fortified places with wide distribution in depth, and with the possibilities for mutual support, to a certain extent could be traced to the past. Some features would correspond to what Vauban, the ingenious constructor of fortifications in the 17th century, created in protection of the eastern and northeastern border of France. But this analogy does not conclusively imply that the attempt to revive ground fortifications requires a return to antiquated conditions.

Rather, it would seem that a war under the present situation could bring back conditions which, despite all the fundamental differences, resemble those of the 17th century more than those of the age of massed armies. The Maginot Line concept with all its shortcomings was related to the latter more than the former. It appears quite likely that ground fortifications will prove to be useful in the future age of small, but highly mobile armies. At relatively low cost, they could render disproportionately great support to the tactical movements and maneuvers of our own troops and impede those of the enemy.

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The free world's massive deterrent to all-out nuclear war may not deter limited or disguised aggression. Local wars, fomented civil strife, military intimidation, and similar forms of limited operations are all down in the Soviet book as very practical methods by which they might achieve their ultimate purpose without ever seriously risking our use of the nuclear retaliatory power at our command. The Soviets have been employing this strategy for well over a decade, during which they and their allies engaged in eight local wars and military actions for Communist aggrandizement. These ranged in size and scope from the Korean war to guerrilla conflicts such as waged in Greece.

It is imperative that we be prepared for every eventuality—for a 'big' war or a local war—for an atomic war, or one in which atomic weapons are not used—for a war fought by Soviet troops, or a war fought by puppet 'volunteers' in an effort to nibble away the fringes of the free world. It does us little good in the long run to be able to deter an enemy from one kind of aggressive action, if at the same time we leave him free to pursue with comparative impunity another course by which he might achieve the same result.

*Secretary of the Army Wilber M. Brucker*

# BOOKS OF INTEREST TO THE MILITARY READER

**VICTORY WITHOUT WAR, 1958-1961.** By George Fielding Eliot. 126 Pages. United States Naval Institute, Annapolis, Md. \$2.00.

In this brief book Mr. Eliot, one of our most competent military analysts and writers, recommends a solution to the growing Russian missile threat.

He postulates that the confidence of the Soviet war lords in their missile program is as misplaced as was the confidence of Goliath in his huge spear and the reason is that such ponderous power could not cope with an assault by a lightfooted adversary.

He pictures the Russian Goliath weighed down with weapons and fixed bases from which to launch ballistic missiles which are good only against fixed targets. If the target is moving, the firing of a huge sophisticated intercontinental ballistic missile (ICBM) is a waste of hardware.

His answer to the Russian threat is mobility and he believes the US can have the requisite mobility by 1961 if she ceases trying to meet the Communist challenge with weapons the Soviets have chosen for their purposes and chooses weapons we know how to use for our purposes.

Mobility brings two great advantages: the ability to operate from shifting, hard to locate bases, and the substitution of a movable base for the first stage of a huge, complicated, and costly ICBM, thereby permitting us to turn from the power race for accurate intercontinental ballistic missiles (a race in which the Russians have

a lead) to the refinement of intermediate range missiles and the production of the mobile forward bases—the nuclear-powered carriers and submarines.

Successful application of this theory, of course, depends on our ability to maintain continuous command of the sea—the ability to use it for our own purposes and to deny it to an enemy. This sounds like a tall order, but the seas are vast and deep and even the largest supercarrier is an easily missed speck. Mr. Eliot believes a sea-based system would be almost immune to a surprise attack by Soviet ballistic missiles and could be defended more effectively than air or missile bases on earth. This, in turn, would mean that the many uncertainties of attack and defense involved in air or submarine operations against US sea-based striking forces would deny a dependable safety factor for Soviet calculations because they would offer little if any prospect of the surprise elimination of these forces before their nuclear strikes could be launched against Soviet targets.

Mr. Eliot is convinced that immediate action and speed are essential to the program he recommends and that if she starts now and selects the right weapons systems, the US can create military capabilities which can turn the Soviet missile program against the men who created it.

The thesis is thought provoking for the strategic planner and for the Army man who must contemplate taking his men and equipment across the seas to gain the final decision and impose the will of his nation on an enemy.

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**THE CROSSING OF ANTARCTICA.** The Commonwealth Trans-Antarctic Expedition 1955-1958. By Sir Vivian Fuchs and Sir Edmund Hillary. 328 Pages. Little, Brown, & Co., Boston, Mass. \$7.50.

BY LT COL HAROLD E. BEATY, CE

Here is a timely and interesting account of brave men who dared to venture into the loneliness and unknown of a vast ice-bound area: the continent of Antarctica. Outfitted with the best available scientific and mechanical gear, Sir Vivian Fuchs and 11 men set out on 24 November 1957 from Shackleton Base to cross this frozen continent. Before them lay 2,500 miles of expanse which was just as inhospitable and cruel then as it was when Captain R. F. Scott, Amundsen, and Shackleton made their heroic assaults to the South Pole a half century earlier.

On 2 March 1958, 99 days later, just one day under the crucial time limit set by Fuchs, the Commonwealth Trans-Antarctic Expedition reached Scott Base on McMurdo Sound. This is the first time that man had accomplished this feat.

This expedition's food was light, its equipment consisted of eight vehicles, sledges, and two dog teams. It had the advantage of support by a light aircraft which proved to be a great asset.

Sir Edmund Hillary, the Everest conqueror, assisted Fuchs by establishing supply points beginning at Scott Base and ending at the South Pole. This New Zealand support party played an important role in the success of the transcontinent march.

This well-written book tells of Fuchs' advance party work in November 1955 to establish a base on Weddell Sea, of how his ship was trapped by the ice, of the two years of preparation, and of the reconnaissance that led to the final attempt. Hillary, in coauthor role, tells of his party's exploration of the immense Skelton Glacier from the Ross Sea and of blazing

a trail for Fuchs' expedition after they had reached the South Pole. Included is an interesting account of the first trans-Antarctic air flight in a single-engine airplane.

The reader will find in this exploration account many examples of physical and moral courage, simple faith, and daring leadership. It is recommended reading for those who love adventure and travel.

**LES ÉTATS-MAJORS.** By Lieutenant Colonel J. D. Hittle, United States Marine Corps. Translation by Lieutenant Colonel Rene Gillet. 288 Pages. Editions Berger-Levrault, Paris, France. \$2.50.

This is a French language translation of the standard United States military reference work, *The Military Staff, Its History, and Development*, with an introduction by General A. Dufourt.

**MASSACRES OF THE MOUNTAINS.** A History of the Indian Wars of the Far West 1815-1875. By J. P. Dunn, Jr. 669 Pages. Archer House, Inc., New York. \$6.95.

This history of the Indian wars documents in infinite detail every major engagement fought between the white man and the Indians.

First published in 1886, the volume explains why General Crook stated that, "Greed and avarice on the part of the whites is at the bottom of nine-tenths of all our Indian troubles." It covers the inhuman conditions under which the Indians often were forced to live, and underlines the fact that most of our most famous fighting generals tried to intercede in favor of the Indians.

Although it was first published many years ago, the stories it tells and the careful documentation and authoritative references make this book alive and readable—an absolute must for every student, librarian, and historian of the Far West.

**THE SOCIAL IMPACT OF BOMB DESTRUCTION.** By Fred Charles Iklé. 250 Pages. The University of Oklahoma Press, Norman, Okla. \$3.95.

BY MAJ CHARLES M. SIMPSON, III, *Inf*

Very little has been written on thermonuclear warfare once the first exchange of bombs takes place, and that which has been written concentrates on the physical and biological effects. Dr. Iklé, currently on the staff of the Social Science Division of the Rand Corporation, has made a real contribution to the literature of thermonuclear warfare with this volume.

Recognizing the decisive element that populations and manpower play in the modern industrial nation and the vulnerability of the urban areas that hold a disproportionately large percentage of the talent of a nation, Dr. Iklé has attempted to analyze the effects of extensive nuclear bombing on the most precious resource—man.

Although, fortunately, there is little statistical data on nuclear damage, other than the two Japanese cities, the author has not limited his findings to an analysis of Hiroshima and Nagasaki. He has utilized the results of many historical disasters—the World War II bombings of Germany, England, Poland, and Japan and natural calamities ranging from the dreaded "Black Plague" of the Middle Ages to the 1953 floods in Holland.

By extrapolation the research and findings of a wide variety of large disasters is applied to the effects that can be reasonably assumed to result from thermonuclear warfare.

The final two chapters are of general interest to all for the author lifts his eyes from his statistical tables and takes a look at the national level and the postwar picture after a thermonuclear holocaust.

This excellent book is a "must" for the student of nuclear warfare—particularly the Army officer.

**KITCHENER. Portrait of an Imperialist.** By Philip Magnus. 410 Pages. E. P. Dutton & Co., Inc., New York. \$6.50.

BY MAJ KEITH C. NUSBAUM, *Arty*

The reader is warned at the outset that the author used the magnifying glass rather than the telescope to peer into the life of one of England's greatest heroes. As a result, the inner flaws as well as the visible front are starkly apparent.

Through ruthless ambition and personal drive, Kitchener rose to command of the Egyptian Army at the age of 46. As Kitchener Pasha he led the combined British and Egyptian forces to victory against the Dervish tribesmen of the Sudan, earning public acclaim which has never left him. After a lengthy but successful campaign against the Boers in South Africa, and command of the Indian Army, he was the logical choice for Commander in Chief of the British Army and Secretary of State for War for Great Britain at the start of World War I.

His life was lost in the sinking of a ship taking him to Russia for a liaison visit at a time when the confidence in him of his colleagues in the British Cabinet had been shaken by repeated errors in judgment, and frequent fits of indecision over the preceding 18 months.

This book will hardly gain Kitchener many posthumous friends. The military reader, looking for guidance from past campaigns, will find little of tactical interest. But for those who enjoy and profit from the study of personalities, motivations, and the crosscurrents which pull from all sides on men in high public office, this book will prove to be a valuable addition to a selective library, or perhaps provide a worthwhile subject or two for later thought.

**GLIDING. A Handbook of Soaring Flight.** By Derek Piggott. 261 Pages. The Macmillan Co., New York. \$5.00.

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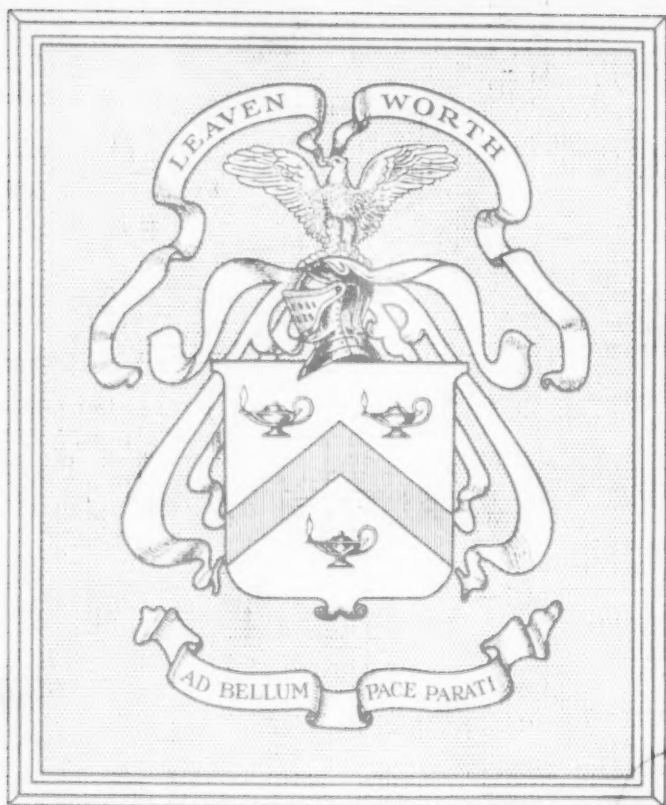
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